SHARP SERVICE MANUAL

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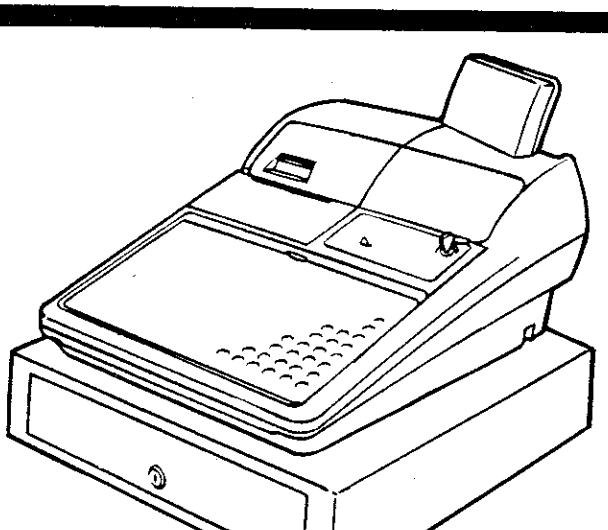

ELECTRONIC CASH REGISTER

MODEL ER-A570

SRV Key : LKGIM7113RCZZ
PRINTER : M-820
(For "V" version)

CAUTION
EXTREME CAUTION MUST BE TAKEN WHEN SERVICING THIS MACHINE. EVEN THOUGH THE MODE SWITCH IS IN THE ⏻ POSITION, VOLTAGE IS STILL SUPPLIED TO THE ENTIRE MACHINE.
WHEN WORKING ON THIS MACHINE MAKE SURE THAT THE POWER CORD IS REMOVED FROM THE WALL OUTLET.

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PARTS GUIDE

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

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The contents are subject to change without notice.

CHAPTER 1. SPECIFICATIONS

1. Appearance/Rating

1) Appearance

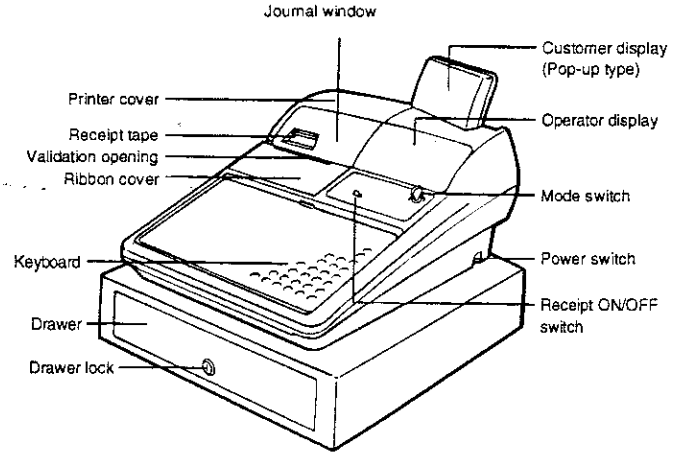


Fig. 1-1

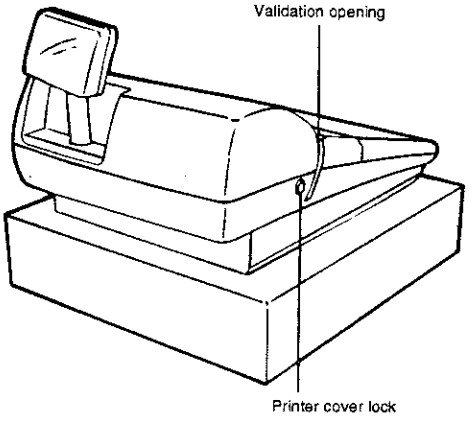


Fig. 1-2

2) Rating

Power source	AC local voltage (±10%) 50Hz/60Hz
Power consumption	Standby: 20 W Maximum: 40 W(Germany), 40 W(U.K), with options installed.
Operating temperature	0°C~40°C (32°F~104°F)
Operating humidity	10%~90% (RH)
Physical dimensions, including the drawer	445(W) × 485(D) × 325(H)mm
Weight	17.8 kg

2. Keyboard

1) Standard keyboard layout

↑ RECEIPT	↑ JOURNAL	CLK 1	CLK 2	CLK 3	CLK 4	CLK 5	CLK 6	10	20	30	40	50	60	70	80
RCPT		16	17	18	19	20	L3	9	19	29	39	49	59	69	79
SLIP	VP	11	12	13	14	15	L2	8	18	28	38	48	58	68	78
	GC COPY	6	7	8	9	10	L1	7	17	27	37	47	57	67	77
GUEST #	AUTO	1	2	3	4	5	PRICE SHIFT	6	16	26	36	46	56	66	76
VAT SHIFT	VAT	ⓧ	•	CL	DEPO (+)	NC	#	5	15	25	35	45	55	65	75
%1	%2	7	8	9	DEPO (-)	GLU	CR2	4	14	24	34	44	54	64	74
⊖1	⊖2	4	5	6	AMT	NBAL	CR1	3	13	23	33	43	53	63	73
PO	RA	1	2	3	PLU/ SUB	EX1	CH	2	12	22	32	42	52	62	72
RF	TL	0	00	000	NS	ST	TL	1	11	21	31	41	51	61	71

Fig. 2-1

2) Key top name

① Standard key top

Keytop	Description
0 to 9, 00, 000	Numeric keys
•	Decimal point key
C L	Clear key
⊗	Multiplication key
DEPT. 1~20	Department 1~20 keys
↑ RECEIPT	Receipt paper feed key
↑ JOURNAL	Journal paper feed key
RCPT	Receipt print key
VP	Validation print key
#	Non-add code entry key
AUTO	Atutomatically entry key
NS	No sale key
VAT	Value added tax key
SLIP	Slip print key
GC COPY	Guest check copy key
⊖ 1	Discount 1 key
⊖ 2	Discount 2 key
% 1	% 1 key
% 2	% 2 key
PO	Paid out key
RA	Received on account key
RF	Refund key
↺	Void key
AMT	Amount key
PLU/SUB	PLU/Subdept. code entry key
EX1	Currency Exchange 1 keys
PLU 1~80	Direct/Sub department 1~80 keys
ST	Tax included subtotal key
CR 1	Credit 1 key
CR 2	Credit 2 key
CH	Check key
TL	Total key
VAT SHIFT	VAT Shift key
GUEST #	Guest number entry key
CLK1~6	Clerk 1~6 keys
L1~3	Level 1~3 keys
Price shift	Price shift key
DEPO (+)	Deposit (+) key
DEPO (–)	Deposit (–) key
NC	New check key
GLU	Guest look up key
NBAL	New balance key

② Option key top

Keytop	Description
DEPT. 21~99	Department 21~99 keys
PLU 81~158	Direct/Sab department 81~158 keys
⊖ 3, 4	Discount 3 and 4 keys
% 3, 4	%3 and 4 keys
CR3~8	Credit 3~8 keys
CA 2	Cash 2 key
EX 2~9	Currency Exchang 2~9 keys
AUTO 2 ~10	Automatically entry key 2~10
1/2	1/2 key
CH2 ~ CH4	Check2 ~ 4 keys
CLK7 ~ CLK10	Push button clerk7 ~ 10 keys
2nd PRICE	Second price entry key
RA2	Received account 2 key
PO2	Paid out 2 key
DEPT#	Department nimber entry key
CHK PR	Check print key
SCALE	Scale key
DIFF ST	Differ subtotal key
CLK#	Clerk number key
FINAL	Tentative finalize key
PINT	Pint key
B. T.	Bill totalizing key
B. S.	Bill separate key

3. Mode switch

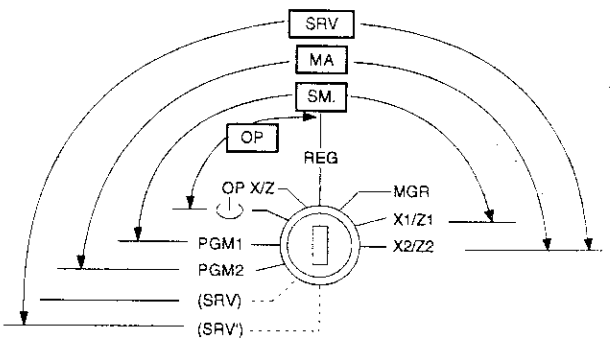


Fig. 3-1

* The key can be removed in the REG or OFF position.
* In the SRV' mode, key inputs are prohibited and no display is made.
* With the key in the off position power is still supplied to the main PWB.

[Functions]

- Function for each key position
- SRV': System reset
- SRV: Service mode (Service programming)
- PGM2: Allows programming of an item that is not changed frequently, in addition to the PGM1 mode programming.

- PGM1: Allows programming of items frequently changed (e.g. department, PLU pricing, and discount rate setting).
- OP/XZ: Allows X or Z operation by servers or cashiers.
- REG: Allows registrations.
- MGR: Allows the operations, by authorized person such as a manager (e.g. correction after transaction finished or cancellation of entry limits), which are not permitted to ordinary cashiers.
- X1/Z1: Allows reading and resetting of a day's sales total.
- X2/Z2: Allows reading or resetting sales totals in a specified period.
- ⏻ : Switching off the display to prevent key board entries.
  (The setting does not turn off the AC power.)

4. Display

1) Layout

① Operator display

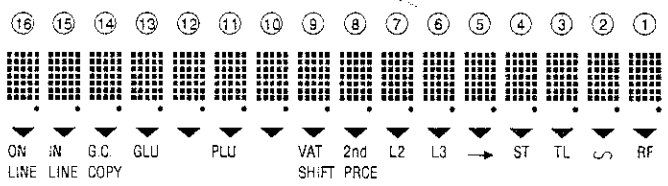


Fig. 4-1

	Dot display
No. of positions	16
Color of display	Green
Character size	8.15 (H) × 5.75 (W) mm
Font	Dot matrix (5×7)

② Customer display

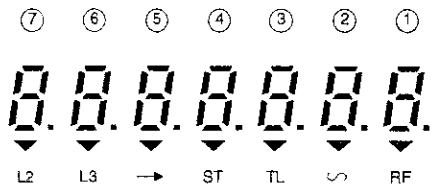


Fig. 4-2

No. of positions	7
Color of display	Green
Character size	13(H) × 6(W) mm
Font	7 segments

Lamps

Display contents	Description
ON LINE	The lamp lights up when the machine is connected to the online transmission line; and it goes off when the machine is disconnected from the line. The lamp blinks during data transmission.
IN LINE	The lamp lights up during inline communications.
G. C. COPY	The lamp is on while the machine is in the GUEST CHECK COPY mode.
GLU	The lamp lights up when a NC (New check) or PBLU key depressed, and it goes off when a transaction operation is finalized.
PLU	The lamp lights up when a PLU entry is made.
VAT SHIFT	The lamp lights up when the VAT SHIFT key is pressed.
2nd PRICE	The lamp lights up when the 2nd PRICE key is pressed.
L2	The lamp lights up when the PLU level is 2.
L3	The lamp lights up when the PLU level is 3.
→	The lamp lights up when the change due is displayed after an amount tendered entry.
ST	The lamp lights up when a subtotal is displayed.
TL	The lamp lights up when a transaction is finalized with CASH, CHECK, CREDIT, or CHARGE key, however, the lamp does not light up when a transaction is finalized with an amount tendered entry.
VOID	The lamp lights up when a void key entry is made.
RF	The lamp lights up when a RF key entry is made.

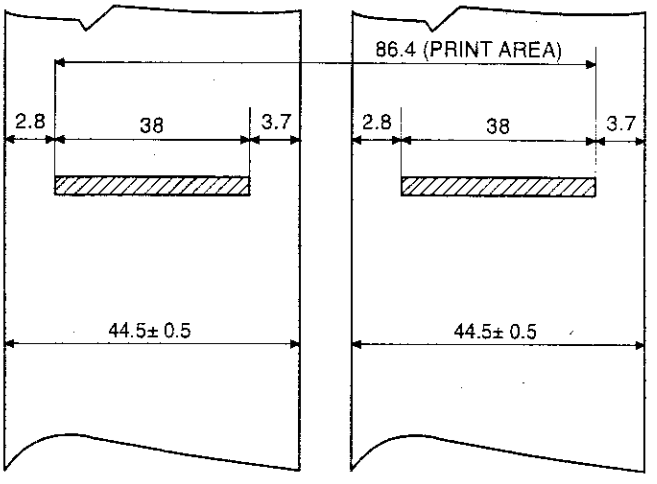
5. Printer (M-820)

1) Specifications

- Part number: M-820
- No. of stations: 2
- Printing system: Mechanical serial dot
- Direction of printing: Bidirectional
- Printing capacity: Receipt – 21 characters
  Journal – 21 characters
  Validation – 47 characters
  (one line only)
- Character size: 2.7 (H) × 1.5 (W) mm
  Print pitch:
  Column distance 1.83 mm
  Row distance 4.3 mm
- Total number of dots: (95 dots per line) × 2 (receipt and journal)
  Validation Max 213 dot
- Font: 7 × 7 dots
  Space between characters – 1 dot
- Distance between dots: 0.4 mm (H) × 0.407 mm (W)
- Journal near end sensor: Service route option
- Auto cutter: Set up (Full and partial cat.)
- Print speed: Approx. 2.5 lines/sec. (Approx. 26.4V)
- Paper feed speed: Receipt – Approx. 28.2 lines/sec.
  Journal – Approx. 11.2 lines/sec.
- Reliability: MCBF – 2 million lines (excluding the print head)
  Head life – 40 million characters
  (in the case of printing average 2 dots per character per wire
- Validation form sensor: Not setup

2) Printing area

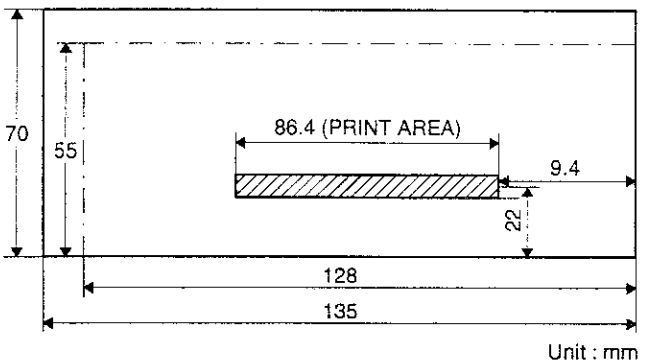
Receipt/journal



Unit : mm

Fig. 5-1

Validation form



Unit : mm

Fig. 5-2

3) Paper

- Paper roll dimensions: 44.5±0.5mm in width, 80mm in diameter
- Paper quality: Journal
  Bond paper (paper thickness: 0.06 to 0.09mm, paper weight: 52.3 to 64g/m^2)
  Validation form
  Thickness: 0.07 to 0.14mm
  Size: 135mm or more (W) ×
  70mm or more (H)

4) Inking

- Ink supply system: Ink ribbon
- Form: Cartridge
- Specification: Material – Nylon
- Ribbon life: 6 million characters
- Print color: Purple (single color)

5) Logo stamp

- Material: Porous rubber
- Stamp color: Purple (single color)
- Max. stamp size: 30(W) × 20(H) mm
- Ink refill: Allowed (UINK-1001CCZZ: 5CC)

CHAPTER 2. OPTIONS

1. System configuration

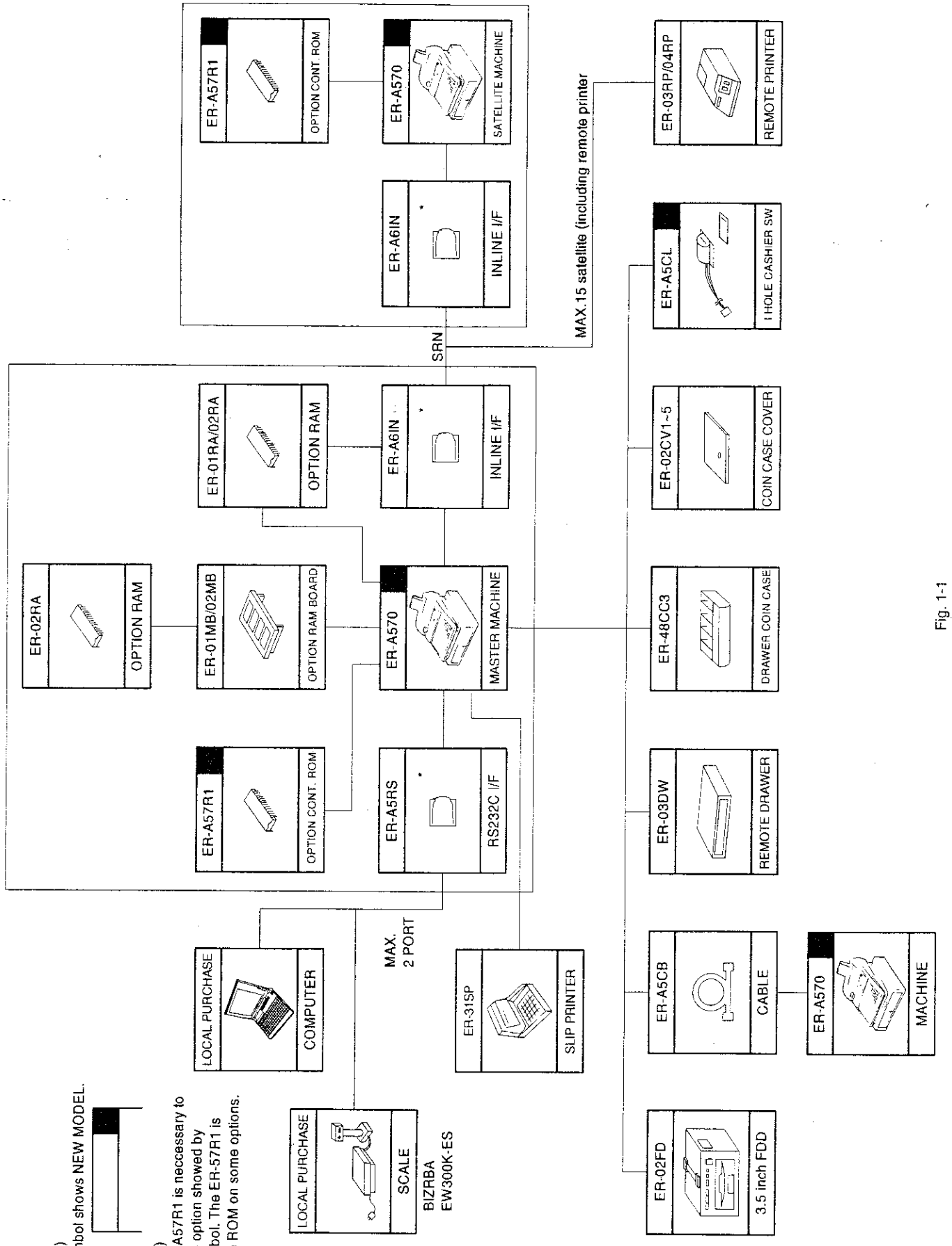


Fig. 1-1

2. Options

NO	NAME	MODEL	DESCRIPTION
1	REMOTE PRINTER	ER-03RP	Via SRN I/F (ER-A6IN)
		ER-04RP	
2	1 HOLE CLERK KEY	ER-A5CL	
3	REMOTE DRAWER	ER-03DW	4B/8C, MAX. 3 units
4	COIN CASE	ER-48CC3	4B/8C
5	COIN CASE COVER	ER-02CV1 ~ 5	For ER-48CC3
6	EXPANSION RAM CHIP	ER-01RA	32K bytes RAM chip
		ER-02RA	128K bytes RAM chip
7	EXPANSION MEMORY BOARD	ER-01MB	128K bytes memory board with 3 IC sockets (For ER-02RA)
		ER-02MB	1M bytes memory board
8	IN-LINE SYSTEM	ER-A6IN	SRN inline I/F
9	ON-LINE SYSTEM	ER-A5RS	2ports RS-232 I/F
10	CONTROL ROM	ER-A61R1	Control for ER-A6IN, ER-A5RS
11	PRESETS LOADER	ER-02FD	FD unit
12	CONNECTION CABLE	ER-A5CB	Loader cable
13	SLIP PRINTER	ER-31SP	
14	WMF CLERK KEY I/F	ER-A6WF	

3. Service options

NO.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	SERVICE KEY	LKGIM7113RCZZ	AK	For the mode switch
2	DRIP-PROOF SWITCH COVER	GCOV87047RCZZ	BA	
3	MODE KEY GRIP COVER	LKGIM7126RCZZ	AL	OP key only
4	DRAWER FIXING KIT	DKIT-8633RCZZ	BE	
5	JOURNAL NEAR END SENSOR	DKIT-8643RCZZ	BG	
6	ADDITIONAL CLERK KEY (Option for ER-A5CL)	LKGIM7346RCZZ	AX	Key No. = 7
		LKGIM7347RCZZ	AX	Key No. = 8
		LKGIM7348RCZZ	AX	Key No. = 9
		LKGIM7349RCZZ	AX	Key No. = 10
		LKGIM7350RCZZ	AX	Key No. = 11
		LKGIM7351RCZZ	AX	Key No. = 12
		LKGIM7352RCZZ	AX	Key No. = 13
		LKGIM7353RCZZ	AX	Key No. = 14
		LKGIM7354RCZZ	AX	Key No. = 15

4. Service tools

NO.	NAME	PARTS CODE	PRICE RANK
1	EXPANSION PWB	CKOG-6708RCZZ	BU
2	SIO LOOP BACK CONECTOR	UKOG-6704RCZZ	AV

5. Supplies

NO.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	ROLL PAPER	DPAPR1006CSZZ	AR	5rolls/pack
2	INK RIBBON	PRBN-6640RCZZ	AX	
3	INK FOR STAMP	UINK-1001CCZZ	AK	5cc
4	KEY SHEET	PSHEK6823BHZZ	AK	Programming character sheet
		PSHEK6822BHZZ	AR	Standard character sheet
		PSHEK6777RCZZ	AC	Blank character sheet

6. Options

For installation of the options, refer to the Installation Manual which is separately issued from this manual.

7. How to use service tools

7-1. SIO loop back connector: UKOG-6704RCZZ

- External view

Signal	Pin	
GND	1	N.C
$\overline{ER}$	2	
$\overline{DR}$	3	
RXD	4	
TXD	5	
$\overline{CD}$	6	
$\overline{RR}$	7	
$\overline{CS}$	8	
$\overline{RS}$	9	

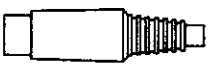


Fig. 7-1

- Purpose: Used for "SIO Test 1 (SIO loop back test)."
- Installation view:

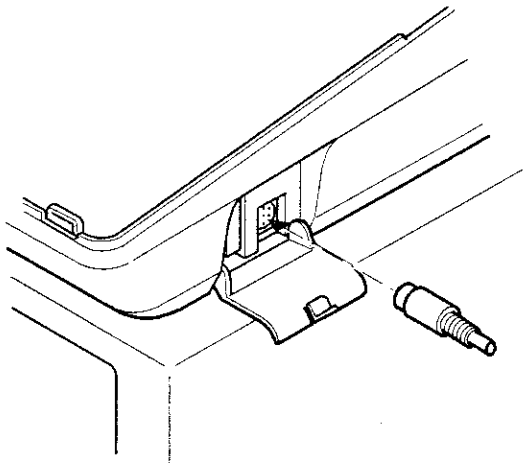


Fig. 7-2

- How to use: Connect the UKOG-6704RCZZ to the body and perform the following key operations:

  SRV mode: 117 → TL

7-2. Expansion PWB: CKOG-6708RCZZ

- External view

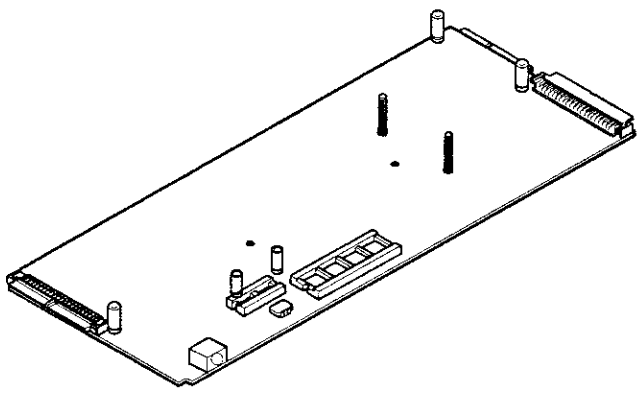


Fig. 7-3

Purpose 1: Used for servicing and repairing of options (such as the ER-A6IN and the ER-A5RS) which are connected with the main body option connector.

[Procedure 1]
Use an insulator base as that in Fig. 7-4 (shaded section) and perform servicing.

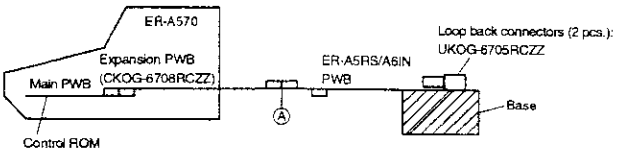


Fig. 7-4

To check the option I/F PWB from the solder side, connect the I/F PWB to OPTCN2. To check from the parts side, connect to OPTCN3.

(Note) The option I/F PWB should be held horizontally so that no excessive stress is applied to connecting section Ⓐ in Fig. 7-4.

[Procedure 2]

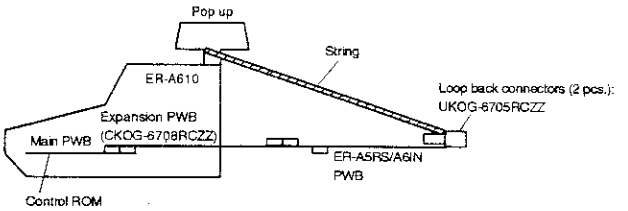


Fig. 7-5

As shown in Fig. 7-5, put a string between the pop up and the option PWB angle and adjust the length of the string so that the CKOG-6708RCZZ and the option PWB. Then perform servicing.

Purpose 2: The CKOG-6708RCZZ is equipped with the loop back connector for checking the ER-A5CB (SIO cable) cable operations.

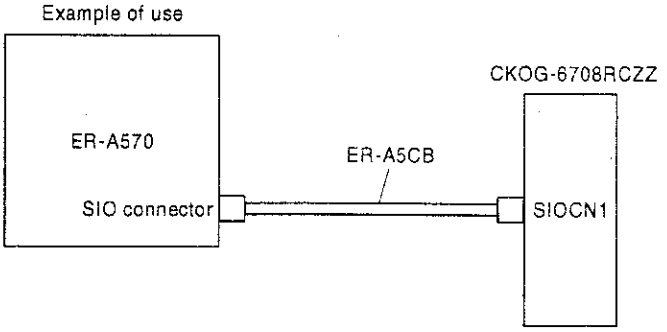


Fig. 7-6

Checking procedure

1) Connect the ER-A5CB between an ECR body and the CKOG-6708RCZZ SIOCN1. (The SIO functions of the ECR must be normal.)
2) Perform test function "117 (SIO loop back test)" and judge it normal or abnormal.

CHAPTER 3. SRV. RESET AND MASTER RESET

1. SRV. reset (Program Loop Reset)

Used to return the machine back to its operational state after a lock-up has occurred.

Procedure

- Method 1
  1) Turn off the AC switch.
  2) Set the mode switch to (SRV') position.
  3) Turn on the AC switch.
  4) Turn to (SRV) position from (SRV') position.
- Method 2
  1) Set the mode switch to PGM2 position.
  2) Turn off the AC switch.
  3) While holding down JOURNAL FEED key and RECEIPT FEED key, Turn on the AC switch.

Note: When disassembling and reassembling always power up using method 1 only. Method 2 will not reset the CKDC4.

Note: SRV programming job#926-B must be set to "4" to allow PGM program loop reset.

2. Master reset (All memory clear)

There are two possible methods to perform a master reset.

- MRS-1

Used to clear all memory contents and return machine back to its initial settings. return keyboard back to default. for default keyboard layout.

Procedure

1) Turn off the AC switch.
2) Set the MODE switch to the (SRV') position.
3) Turn on the AC switch.
4) While holding down JOURNAL FEED key, turn to (SRV) position from (SRV') position.

- MRS-2

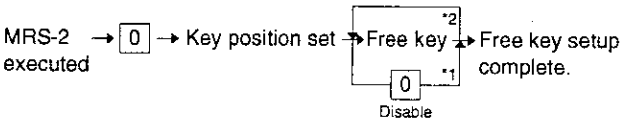
  Used to clear all memory and keyboard contents.
  This reset returns all programming back to defaults. The keyboard must be entered by hand.
  This reset is used if an application needs different keyboard layout other than that supplied by a normal MRS-1.

Procedure

1) Turn off the AC switch.
2) Set the MODE switch to the (SRV') position.
3) Turn on the AC switch.
4) While holding down JOURNAL FEED key and RECEIPT FEED key, turn to (SRV) position from (SRV') position.
5) Key position assignment:

* After the execution of MRS-2, only the RECEIPT FEED and JOURNAL FEED keys can remain effective on key assignment. Any key can be assigned on any key position on the main keyboard.

[key setup procedure]



NOTES:

*1: When the 0 key is pressed, the key of the key number on display is disabled.

*2: Push the key on the position to be assigned. With this, the key of the key number on display is assigned to that key position.

*3: When relocating the keyboard, the PGM 1/2 use standard key layout.

Key number	Key name	Key number	Key name
1	Numeric key "0"	10	Numeric key "9"
2	Numeric key "1"	11	Numeric key "00"
3	Numeric key "2"	12	Numeric key "000"
4	Numeric key "3"	13	Decimal point key
5	Numeric key "4"	14	CL key
6	Numeric key "5"	15	⊗ key
7	Numeric key "6"	16	ST key
8	Numeric key "7"	17	TL key
9	Numeric key "8"		

CHAPTER 4. HARD WARE DESCRIPTION

1. Hard ware block diagram

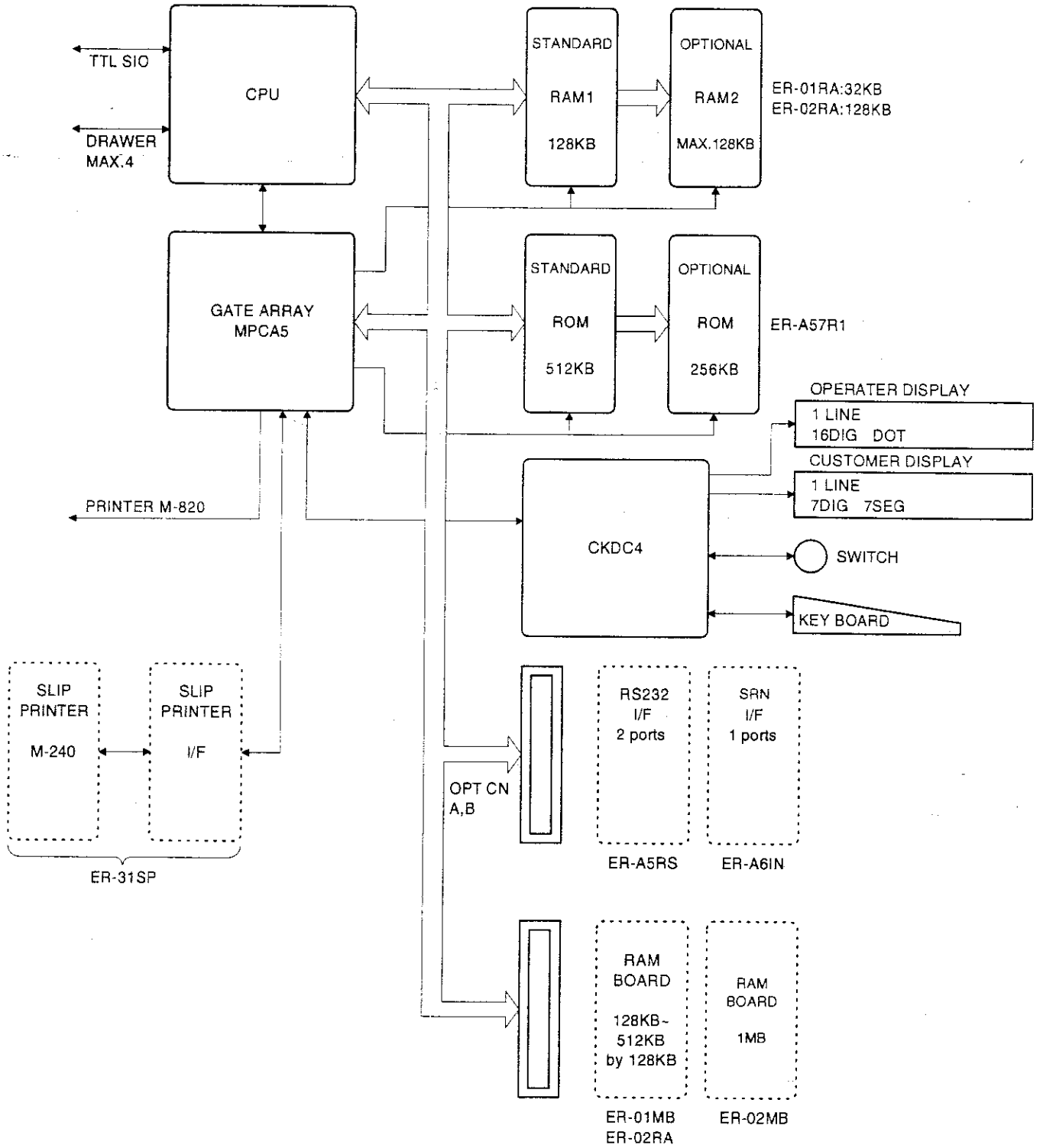
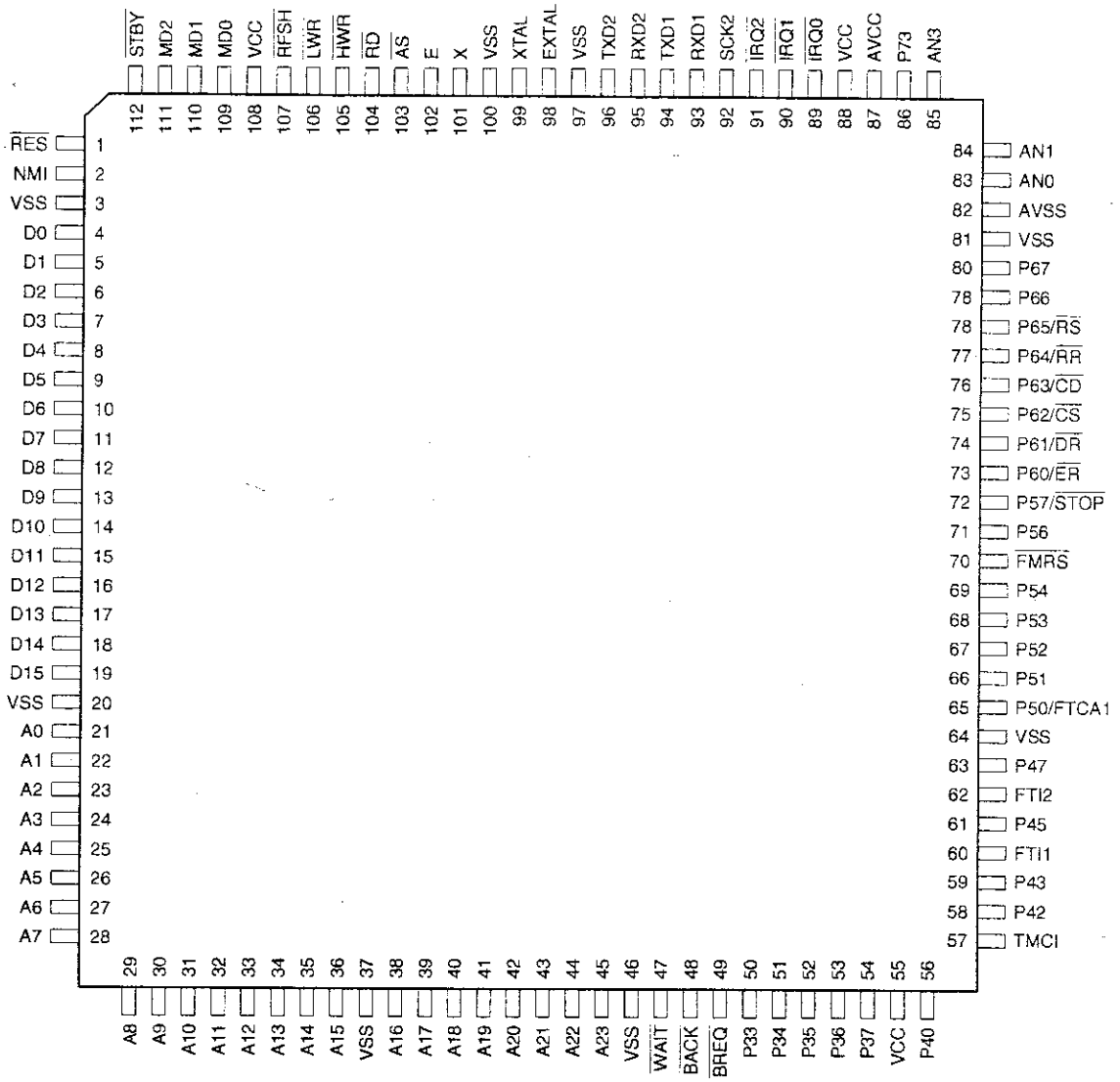


Fig. 1-1

2. Description of main LSI's

2-1. CPU (HD6415108FX)

1) Pin configuration



HD6415108FX pin configuration

Fig. 2-1

2) Block diagram

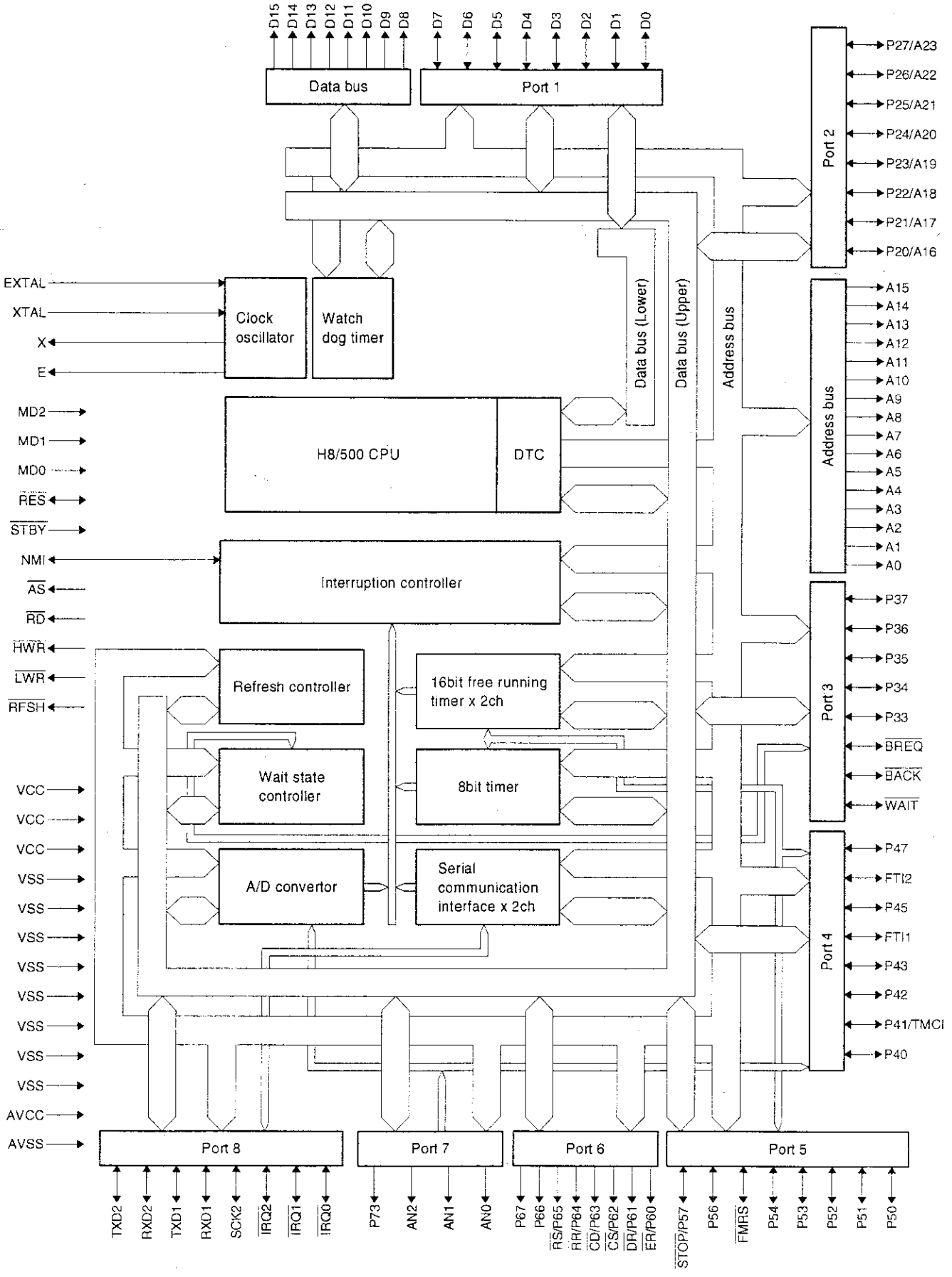


Fig. 2-2

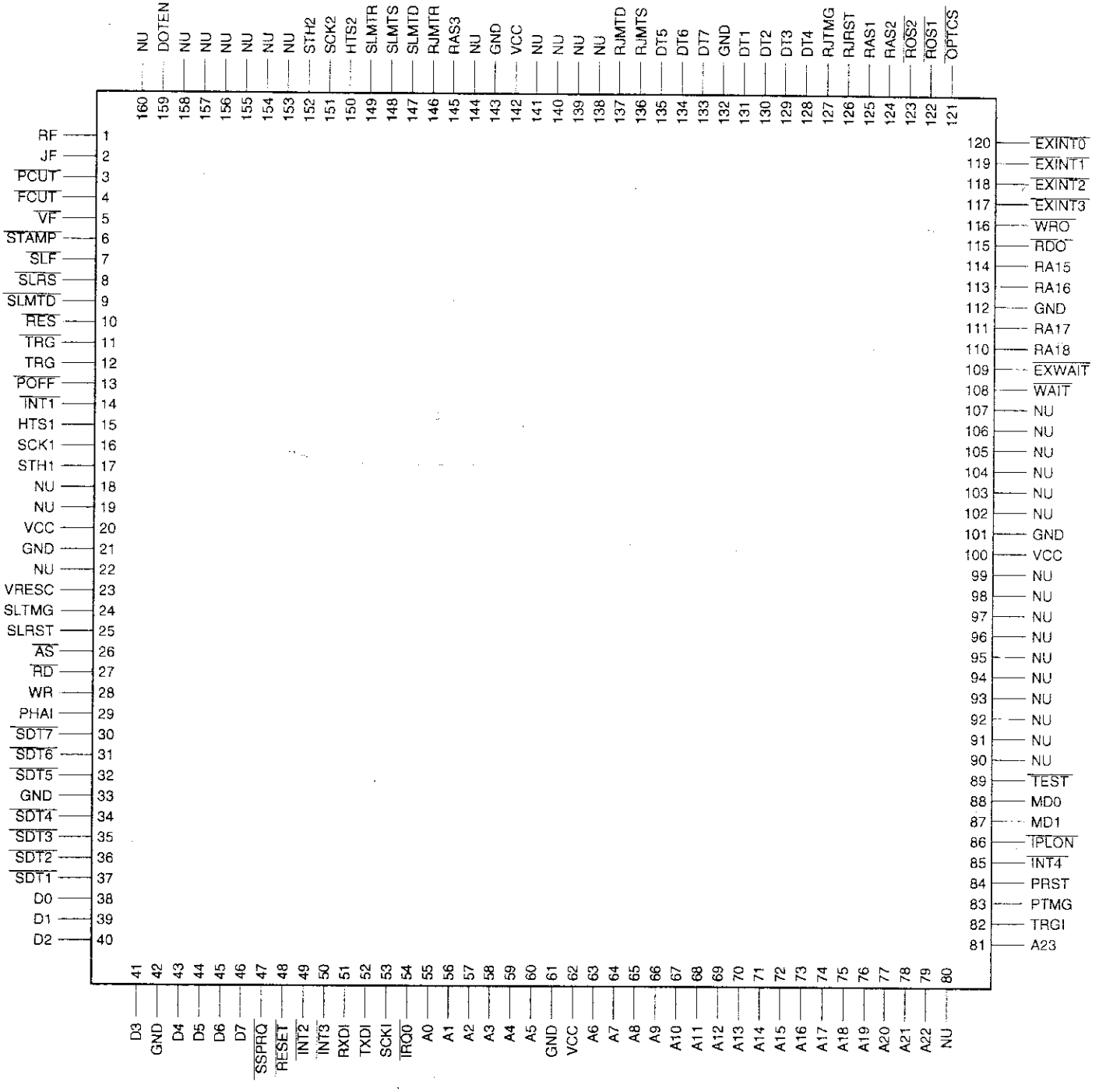
3) Pin description

Pin No.	Symbol	Signal name	In/ Out	Function
1	$\overline{RES}$	$\overline{RESET}$	I/O	Reset input
2	NMi	NMi	In	Non-maskable interrupt input for SSP interrupt input.
3	VSS	NU	In	GND
4	D0	Nu	In	GND
5	D1	Nu	In	GND
6	D2	Nu	In	GND
7	D3	Nu	In	GND
8	D4	Nu	In	GND
9	D5	Nu	In	GND
10	D6	Nu	In	GND
11	D7	Nu	In	GND
12	D8	D0	I/O	Data bus
13	D9	D1	I/O	Data bus
14	D10	D2	I/O	Data bus
15	D11	D3	I/O	Data bus
16	D12	D4	I/O	Data bus
17	D13	D5	I/O	Data bus
18	D14	D6	I/O	Data bus
19	D15	D7	I/O	Data bus
20	VSS	NU	In	GND
21	A0	A0	Out	Address bus
22	A1	A1	Out	Address bus
23	A2	A2	Out	Address bus
24	A3	A3	Out	Address bus
25	A4	A4	Out	Address bus
26	A5	A5	Out	Address bus
27	A6	A6	Out	Address bus
28	A7	A7	Out	Address bus
29	A8	A8	Out	Address bus
30	A9	A9	Out	Address bus
31	A10	A10	Out	Address bus
32	A11	A11	Out	Address bus
33	A12	A12	Out	Address bus
34	A13	A13	Out	Address bus
35	A14	A14	Out	Address bus
36	A15	A15	Out	Address bus
37	VSS	NU	In	GND
38	A16	A16	Out	Address bus
39	A17	A17	Out	Address bus
40	A18	A18	Out	Address bus
41	A19	A19	Out	Address bus
42	A20	A20	Out	Address bus
43	A21	A21	Out	Address bus
44	A22	A22	Out	Address bus
45	A23	A23	Out	Address bus
46	VSS	NU	In	GND
47	$\overline{WAIT}$	$\overline{WAIT}$	In	Wait signal
48	$\overline{BACK}$	$\overline{BACK}$	Out	Bus control request acknowledge
49	$\overline{BREQ}$	$\overline{BREQ}$	In	Bus control request
50	P33	DOPS	In	Drawer open signal
51	P34	$\overline{DR0}$	Out	Option drawer open signal
52	P35	$\overline{DR1}$	Out	Remote drawer No.1 open signal
53	P36	$\overline{DR2}$	Out	Remote drawer No.2 open signal
54	P37	$\overline{DR3}$	Out	Remote drawer No.3 open signal
55	VCC	VCC	In	+5V
56	P40	$\overline{IFV}$	In	Slip printer (M-240) interface connect signal
57	TMCi	$\overline{PTMG}$	In	Printer (M-820) timing signal
58	P42	$\overline{TOF}$	In	Slip printer (M-240) TOF sensor signal
59	P43	$\overline{BOF}$	In	Slip printer (M-240) BOF sensor signal
60	FTi1	$\overline{PRST}$	In	Printer (M-820) reset signal
61	P45	$\overline{NEJ}$	In	Near end sensor journal side
62	FTi2	$\overline{SHEN}$	In	CKDC Interface shift enable signal
63	P47	$\overline{NER}$	In	GND
64	VSS	VSS	In	GND
65	P50/FTCA1	TRGI	Out	Dot pulse adjust signal
66	P51	NU	Out	NC
67	P52	NU	Out	NC
68	P53	NU	In	GND
69	P54	NU	Out	NC
70	$\overline{FMRS}$	NU	In	NC
71	P56	NU	Out	NC
72	P57/$\overline{STOP}$	$\overline{STOP}$	Out	System reset output. Normally
73	P60/$\overline{ER}$	$\overline{ERS}$/$\overline{ER}$	Out	SIO control signal (Equipment ready)
74	P61/$\overline{DR}$	$\overline{DRS}$/$\overline{DR}$	In	SIO control signal (Data set ready)
75	P62/$\overline{CS}$	$\overline{CSS}$/$\overline{CS}$	In	SIO control signal (Clear to send)
76	P63/$\overline{CD}$	$\overline{CDS}$/$\overline{CD}$	In	SIO control signal (Carrier detect)
77	P64/$\overline{RR}$	$\overline{RRS}$/$\overline{RR}$	Out	SIO control signal (Ready to receive)
78	P65/$\overline{RS}$	$\overline{RSS}$/$\overline{RS}$	Out	SIO control signal (Request to send)
79	P66	NU	In	GND
80	P67	NU	In	GND
81	VSS	NU	In	GND
82	AVSS	NU	In	GND
83	AN0	VPR	In	Validation sensor journal
84	AN1	VPJ	In	Validation sensor receipt
85	AN3	VPTEST	In	+24V test input
86	P73	$\overline{VPPS}$	In	Validation sense signal
87	AVCC	AVCC	In	+5V
88	VCC	VCC	In	+5V
89	$\overline{IRQ0}$	$\overline{IRQ0}$	In	Interrupt signal 0
90	$\overline{IRQ1}$	$\overline{IRQ1}$	In	Interrupt signal 1
91	$\overline{IRQ2}$	$\overline{IRQ2}$	In	Interrupt signal 2
92	SCK2	SCKi	In	CKDC Interface sync shift clock
93	RXD1	RXD	In	SIO control signal (Receive data)
94	TXD1	TXD	Out	SIO control signal (Transmit data)

Pin No.	Symbol	Signal name	In/ Out	Function
95	RXD2	RXD2	In	CKDC interface shift input data
96	TXD2	TXDi	Out	CKDC interface shift output data
97	VSS	NU	In	GND
89	EXTAL	EXTAL	In	Crystal oscillator connection
99	XTAL	XTAL	In	Crystal oscillator connection
100	VSS	NU	In	GND
101	X	X	Out	System clock
102	E	NU	Out	Nu
103	$\overline{AS}$	$\overline{AS}$	Out	Address strobe
104	$\overline{RD}$	$\overline{RD}$	Out	Read
105	$\overline{HWR}$	$\overline{WR}$	Out	Write
106	$\overline{LWR}$	$\overline{LWR}$	Out	Nu
107	$\overline{RFSH}$	$\overline{RFSH}$	Out	Refresh cycle
108	VCC	VCC	In	+5V
109	MD0	MD0	In	+5V (MODE 3)
110	MD1	MD1	In	+5V (MODE 3)
111	MD2	MD2	In	GND
112	$\overline{STBY}$	$\overline{STBY}$	In	+5V (Nu)

2-2. G.A (MPCA5)

1) Pin configuration



GATE ARRAY (F258016PC)
MPCA5

Fig. 2-3

2) Block diagram

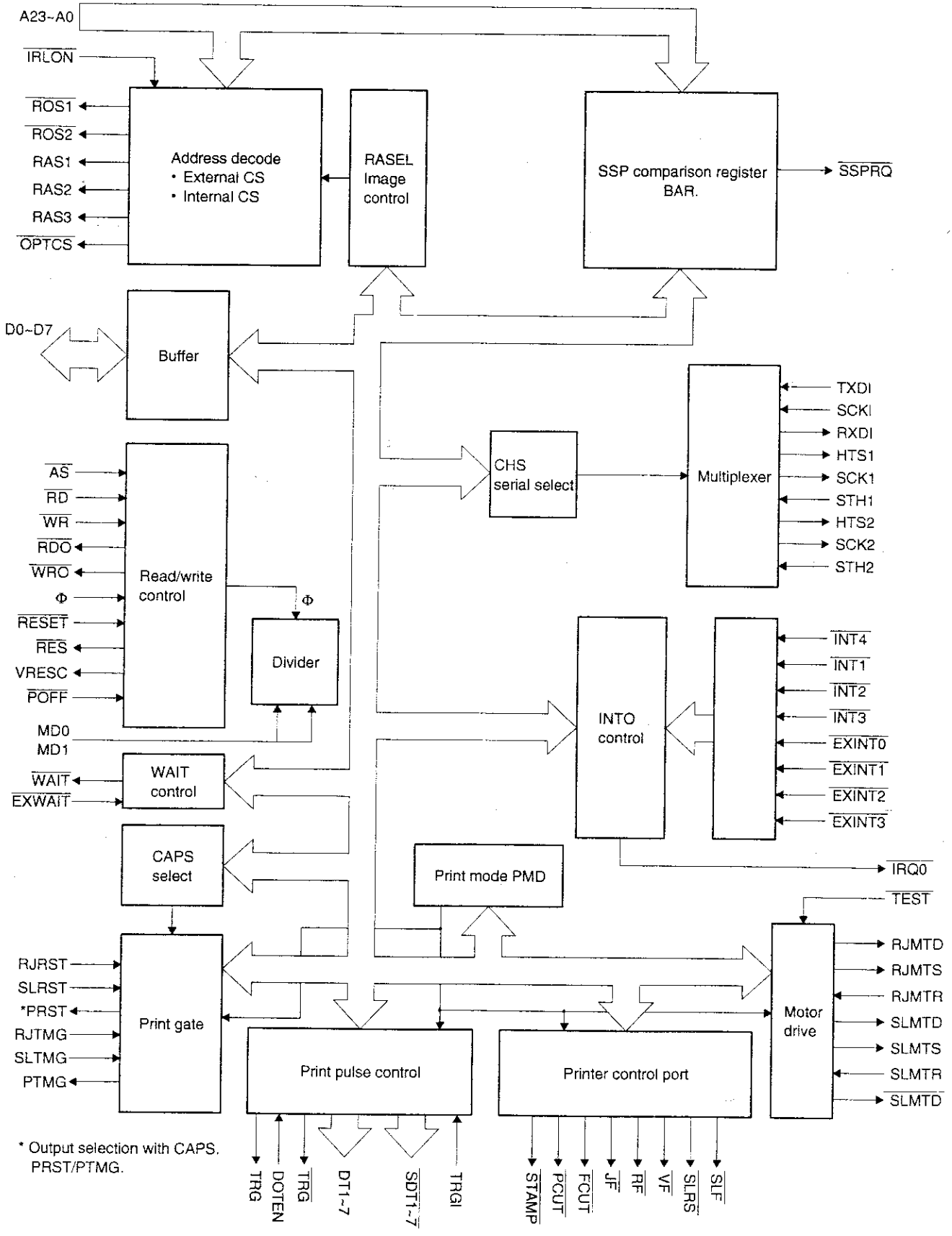


Fig. 2-4

3) Pin description

Pin No.	Signal name	In/ Out	Function
1	RF	Out	Receipt side paper feed solenoid
2	JF	Out	Journal side paper feed solenoid
3	$\overline{PCUT}$	Out	Printer (M-820) partial cut signal = Not used
4	$\overline{FCUT}$	Out	Printer (M-820) auto cut signal = Not used
5	$\overline{VF}$	Out	Multi line validation paper feed = Not used
6	$\overline{STAMP}$	Out	Printer (M-820) stamp signal
7	$\overline{SLFS}$	Out	Slip printer (M-240) paper feed singnal
8	$\overline{SLRS}$	Out	Slip printer (M-240) release signal
9	$\overline{SLMTD}$	Out	Slip printer (M-240) motor drive signal
10	$\overline{RES}$	Out	Peripheral output reset
11	$\overline{TRG}$	Out	Dot head trigger signal (M-240)
12	TRG	Out	Dot head trigger signal (M-820)
13	$\overline{POFF}$	In	Interrupt input
14	$\overline{INT1}$	In	Interrupt signal (Key interrupt request)
15	HTS1	Out	8 bit serial port output
16	SCK1	Out	Serial port shift clock output
17	STH1	In	8 bit serial port input
18	—	—	Nu
19	—	—	Nu
20	VCC	—	+5V
21	GND	—	GND
22	—	—	Nu
23	VRESC	Out	Turns active when reset and power down is met
24	SLTMG	In	Slip printer timing signal
25	SLRST	In	Slip printer reset signal
26	$\overline{AS}$	In	Address strobe
27	$\overline{RD}$	In	Read strobe
28	$\overline{WR}$	In	Write strobe
29	ϕ	In	(ϕ) System clock
30	$\overline{SDT7}$	Out	Printhead drive signal (dot7)
31	$\overline{SDT6}$	Out	Printhead drive signal (dot6)
32	$\overline{SDT5}$	Out	Printhead drive signal (dot5)
33	GND	—	GND
34	$\overline{SDT4}$	Out	Printhead drive signal (dot4)
35	$\overline{SDT3}$	Out	Printhead drive signal (dot3)
36	$\overline{SDT2}$	Out	Printhead drive signal (dot2)
37	$\overline{SDT1}$	Out	Printhead drive signal (dot1)
38	D0	I/O	Data bus
39	D1	I/O	Data bus
40	D2	I/O	Data bus
41	D3	I/O	Data bus
42	GND	—	GND
43	D4	I/0	Data bus
44	D5	I/0	Data bus
45	D6	I/0	Data bus
46	D7	I/0	Data bus
47	$\overline{SPRQ}$	Out	SSP interrupt request
48	$\overline{RESET}$	In	MPCA5 reset
49	$\overline{INT2}$	In	Interrupt signal (Nu)
50	$\overline{INT3}$	In	Interrupt signal (Nu)
51	RXDI	Out	8 bit serial port output to CPU
52	TXDI	In	8 bit serial port input from CPU

Pin No.	Signal name	In/ Out	Function
53	SCKI	In	Serial port shift clock input from CPU.
54	$\overline{IRQ0}$	Out	Interrupt request to CPU
55	A0	In	Address bus
56	A1	In	Address bus
57	A2	In	Address bus
58	A3	In	Address bus
59	A4	In	Address bus
60	A5	In	Address bus
61	GND	—	GND
62	VCC	—	+5V
63	A6	In	Address bus
64	A7	In	Address bus
65	A8	In	Address bus
66	A9	In	Address bus
67	A10	In	Address bus
68	A11	In	Address bus
69	A12	In	Address bus
70	A13	In	Address bus
71	A14	In	Address bus
72	A15	In	Address bus
73	A16	In	Address bus
74	A17	In	Address bus
75	A18	In	Address bus
76	A19	In	Address bus
77	A20	In	Address bus
78	A21	In	Address bus
79	A22	In	Address bus
80	—	—	Nu
81	A23	In	Address bus
82	TRGI	In	Dot pulse control/drive signal
83	$\overline{PTMG}$	Out	Printer timing signal
84	$\overline{PRST}$	Out	Printer reset signal
85	$\overline{INT4}$	In	Interrupt signal
86	$\overline{IPLON}$	In	Nu
87	MD1	In	Mode select input
88	MD0	In	Mode select input
89	$\overline{TEST}$	In	Nu
90	—	—	Nu
91	—	—	Nu
92	—	—	Nu
93	—	—	Nu
94	—	—	Nu
95	—	—	Nu
96	—	—	Nu
97	—	—	Nu
98	—	—	Nu
99	—	—	Nu
100	VCC	—	+5V
101	GND	—	GND
102	—	—	Nu
103	—	—	Nu
104	—	—	Nu
105	—	—	Nu
106	—	—	Nu

Pin No.	Signal name	In/ Out	Function	
107	—	—	Nu	
108	$\overline{WAIT}$	Out	Wait request signal	
109	$\overline{EXWAIT}$	In	External wait control input signal	
110	RA18	Out	Nu	
111	RA17	Out	Nu	
112	GND	—	GND	
113	RA16	Out	Nu	
114	RA15	Out	Nu	
115	$\overline{RDO}$	Out	Expansion RD signal	Option
116	$\overline{WRO}$	Out	Expansion WR signal	
117	$\overline{EXINT3}$	In	Expansion interruption signal 3	Option
118	$\overline{EXINT2}$	In	Expansion interruption signal 2	
119	$\overline{EXINT1}$	In	Expansion interruption signal 1	
120	$\overline{EXINT0}$	In	Expansion interruption signal 0	
121	$\overline{OPTCS}$	Out	Chip select base signal for expansion option	
122	$\overline{ROS1}$	Out	ROM 1 chip select signal	
123	$\overline{ROS2}$	Out	ROM 2 chip select signal	
124	RAS2	Out	RAM 2 chip select signal	
125	RAS1	Out	RAM 1 ship select signal	
126	RJRST	In	M820 reset signal	
127	RJTMG	In	M820 timing signal	
128	DT4	Out	M820 dot signal	
129	DT3	Out	M820 dot signal	
130	DT2	Out	M820 dot signal	
131	DT1	Out	M820 dot signal	
132	GND	—	GND	
133	DT7	Out	M820 dot signal	
134	DT6	Out	M820 dot signal	
135	DT5	Out	M820 dot signal	
136	RJMTS	Out	M820 motor brake signal	
137	RJMTD	Out	M820 motor drive signal	
138	—	—	Nu	
139	—	—	Nu	
140	—	—	Nu	
141	—	—	Nu	
142	VCC	—	+5V	
143	GND	—	GND	
144	—	—	Nu	
145	RAS3	Out	Nu	
146	RJMTR	In	M820 motor lock detection signal	
147	SLMTD	In	Nu	
148	SLMTS	In	Nu	
149	SLMTR	In	GND	
150	HTS2	Out	Nu	
151	SCK2	Out	Nu	
152	STH2	In	Nu	
153	—	—	Nu	
154	—	—	Nu	
155	—	—	Nu	
156	—	—	Nu	
157	—	—	Nu	
158	—	—	Nu	
159	DOTEN	Out	Dot drive enable signal	
160	—	—	Nu	

2-3. CKDC4 (HD404728A20FS)

1) General description

The CKDC4 is a 4-bit microcomputer developed for the ER-A670 and provides functions to control the real-time clock, keys, and displays. The basic functions of the CKDC4 are shown below.

Keys: The CKDC4 is capable of controlling a maximum of 256 momentary keys. (Sharp 2-key rollover control)
Simultaneous scanning of key and switch
(When a key is scanned, the state of a mode and clerk switch is also buffered. The host can scan the state of switch together with the key entry data at the same time the key is scanned.)

Switches: Mode switch with 14 positions maximum
8-bit clerk (cashier) switch
2-bit feed switch
1-bit receipt on/off switch
1-bit option switch
4-bit general-purpose switch (1-bit is used for keyboard select)

Displays: 16-column dot display
12-column 7-segment display (column digit selectable)
All column blink controlled for the dot and 7-segment display decimal point and indicators
Programmable patterns for 7-segment display:
Four patterns
Internal driver for 7-segment display

Buzzer: Single tone control

Clock: Year, month, day of month, day of week, hour, minute

Alarm: Hour, minute

Interrupt request (event control):
Detection of key input, switch position change, alarm issue, and counter overflow

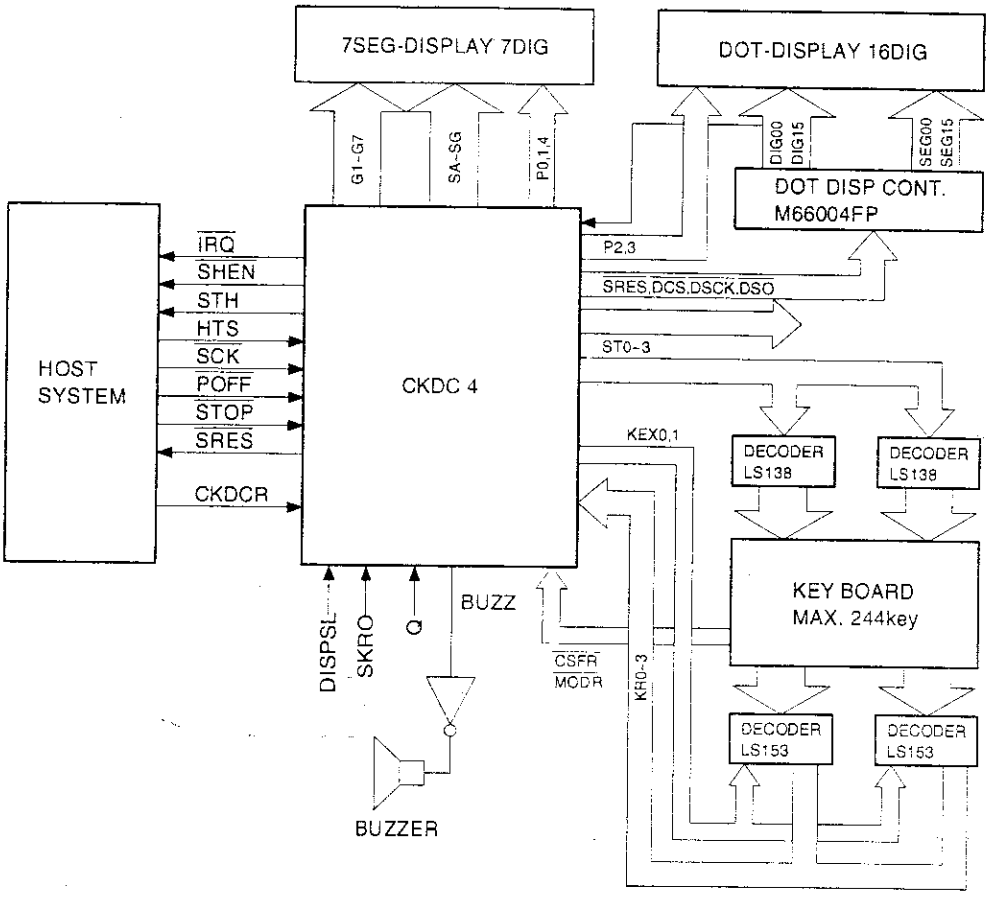


Fig. 2-5

2) Pin assignment

Pin No.	Port	I/O	RESET State	Signal name	I/O	Notes	PULL-UP -DOWN
1	$R0_1$	I/O	H-Z	SB	O	DB4 : SEG-B	PULL-DOWN
2	$R0_2$	I/O	H-Z	SC	O	DB4 : SEG-C	PULL-DOWN
3	$R0_3$	I/O	H-Z	SD	O	DB4 : SEG-D	PULL-DOWN
4	$R1_0$	I/O	H-Z	SE	O	DB4 : SEG-E	PULL-DOWN
5	$R1_1$	I/O	H-Z	SF	O	DB4 : SEG-F	PULL-DOWN
6	$R1_2$	I/O	H-Z	SG	O	DB4 : SEG-G	PULL-DOWN
7	$R1_3$	I/O	H-Z	AP	O	DB7 : 7SEG COM	PULL-DOWN
8	$R2_0$	I/O	H-Z	DDP	O	DB2 : DOT DP	PULL-DOWN
9	$R2_1$	I/O	H-Z	DID	O	DB3 : DOT COM	PULL-DOWN
10	$R2_2$	I/O	H-Z	DP	O	DB5 : 7SEG DP	PULL-DOWN
11	$R2_3$	I/O	H-Z	ID	O	DB5 : 7SEG ID	PULL-DOWN
12	RA_0	I	I	MODR	I	MODE RETURN	PULL-UP
13	RA_1	I	I	CFSR	I	CLEARK, FEED, SWITCH RETURN	PULL-UP
14	$R3_0$	I/O	H-Z	KEX0	O	KEY EXCHANGE0	
15	$R3_1$	I/O	H-Z	KEX1	O	KEY EXCHANGE1	
16	$R3_2$	I/O	H-Z	NU	O	GND	
17	$R3_3$	I/O	H-Z	NU	O	GND	
18	$R5_0$	I/O	I	ST0	O	KEY SCAN ST0	
19	$R5_1$	I/O	I	ST1	O	KEY SCAN ST1	
20	$R5_2$	I/O	I	ST2	O	KEY SCAN ST2	
21	$R5_3$	I/O	I	ST3	O	KEY SCAN ST3	
22	$R6_0$/INT0	I/O	I	POFF	I	P-OFF	
23	$R6_1$/INT1	I/O	I	STOP	I	STOP	PULL-UP
24	$R6_2$/INT2	I/O	I	DDIG	O	DOT DISPLAY DIGIT INPUT	
25	$R6_3$/INT3	I/O	I	DCS	O	DOT DISPLAY CONT./CS	
26	Vcc					Power supply	
27	$R4_0$/SCK	I/O	I	SCK	I	SCK	
28	$R4_1$/SI	I/O	I	HTS	I	HTS	
29	$R4_2$/SO	I/O	I	STH	O	STH	
30	$R4_3$/PWM	I/O	I	SDISP	I	DIST SELECT	
31	$R7_0$/BUZZ	I/O	I	BUZZ	O	BUZZER	
32	$R7_1$/SCK2	I/O	I	DSCK	O	DOT DISP CONT. SCK	
33	$R7_2$/SI2	I/O	I	SRES	O	SYSTEM RESET	PULL-DOWN
34	$R7_3$/S02	I/O	O	DSO	O	DOT DISP CONT. SO	
35	$R8_0$	I/O	O	SHEN	O	SHEN	
36	$R8_1$	I/O	O	KRQ	O	KEY REQUEST	
37	$R9_0$	I	I	KR0	I	KEY RETURN 0	
38	$R9_1$	I	I	KR1	I	KEY RETURN 1	
39	$R9_2$	I	I	KR2	I	KEY RETURN 2	
40	$R9_3$	I	I	KR3	I	KEY RETURN 3	
41	RESET	I	I	CKDCR	I	CKDC IV RESET	
42	OSC2					4.19 MHz X'tal	
43	OSC1						
44	GND					GND	
45	CL1					32.768 KHz OSC	
46	CL2						
47	TEST	I	I	VCKDC		5V	
48	D0	I/O	H-Z	G1	O	7 SEG DIG 1	PULL-DOWN
49	D1	I/O	H-Z	G2	O	7 SEG DIG 2	PULL-DOWN
50	D2	I/O	H-Z	G3	O	7 SEG DIG 3	PULL-DOWN
51	D3	I/O	H-Z	G4	I	7 SEG DIG 4	PULL-DOWN
52	D4	I/O	H-Z	G5	O	7 SEG DIG 5	PULL-DOWN
53	D5	I/O	H-Z	G6	O	7 SEG DIG 6	PULL-DOWN
54	D6	I/O	H-Z	G7	O	7 SEG DIG 7	PULL-DOWN
55	D7	I/O	H-Z	NU	O		PULL-DOWN
56	D8	I/O	H-Z	NU	O		PULL-DOWN
57	D9	I/O	H-Z	NU	O		PULL-DOWN
58	D10	I/O	H-Z	NU	O		PULL-DOWN
59	D11	I/O	H-Z	NU	O		
60	D12	I/O	H-Z	NU	O		
61	D13	I/O	H-Z	NU	O		
62	D14	I/O	H-Z	NU	O		
63	D15	I/O	H-Z	NU	O		
64	$R0_0$	I/O	H-Z	SA	O	DB4 : SEG-A	PULL-DOWN

NOTE 3: Pull-up/down in the table indicates that the lines concerned require external pull-up/down resistance.

3. Clock generator

1) CPU (HD6415108FX)

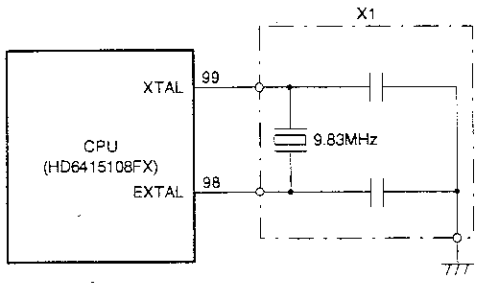


Fig. 3-1

Basic clock is supplied from a 9.83MHz ceramic oscillator.
The CPU contains an oscillation circuit from which the basic clock is internally driven. If the CPU was not operating properly, the signal does not appear on this line in most cases.

2) HD404728A20FS CKDC-III oscillation circuit (Display-PWB)

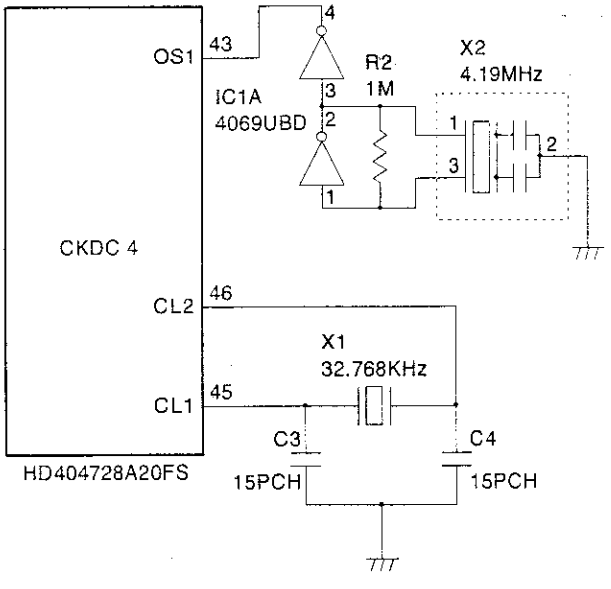


Fig. 3-2

Two oscillators are connected to the CKDC4.
The main clock X2 generates 4.19MHz which is used during power on.
When power is turned off, the CKDC4 goes into the standby mode and the main clock stops.
The sub-clock X1 generates 32.768KHz which is primarily used to update the internal RTC (real time clock). During the standby mode, it keeps oscillating to update the clock and monitoring the power recovery.

4. Reset (POFF) circuit

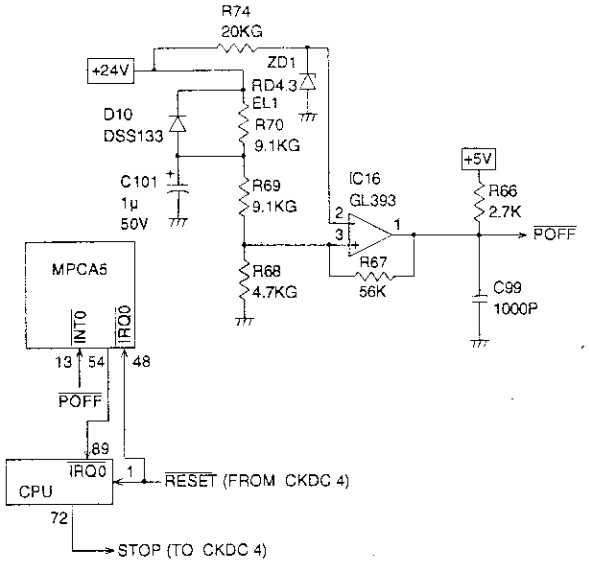


Fig. 4-1

In order to prevent memory loss at a time of power off and power supply failure of the ECR, the power supply condition is monitored at all times. When a power failure is met, the CPU suspends the execution of the current program and immediately executes the power-off program to save the data in the CPU registers in the external S-RAM with the signal $\overline{\text{STOP}}$ forced low to prepare for the power-off situation. The signal $\overline{\text{STOP}}$ is supplied to the CKDC4 as signal $\overline{\text{RESET}}$ to reset the devices.
This circuit monitors +24V supply voltage.
The voltage at the (–) pin of the comparator GL393 is always maintained to 4.3V by means of the zener diode ZD1, while +24V supply voltage is divided through the resistors R70, R69, and R68, and is applied to the (+) pin. When normal +24V is in supply, 5.1V is supplied to the (+) pin, therefore, signal $\overline{\text{POFF}}$ is at a high level. When +24V supply voltage decreases due to a power off or any other reason, the voltage at the (+) pin also decreases. When +24V supply voltage drops, the voltage at the (+) pin drops below +4.3V, which causes $\overline{\text{POFF}}$ to go low, thus predicting the power-off situation.

5. Memory control

1) Memory map

① All range memory map

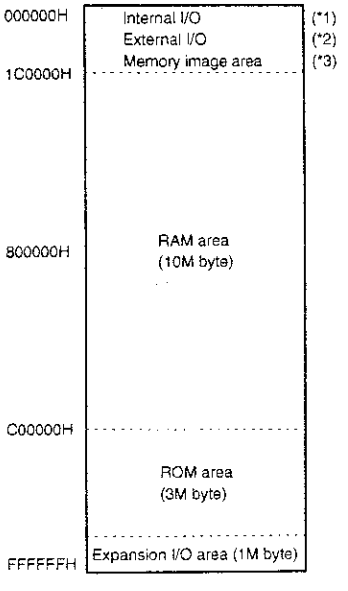


Fig. 5-1

(*1) "Internal I/O" means the registers in the H8/510.

:2) "External I/O" means the base system I/O area to be addressed in page 0.

(*3) "Memory image area" means the lower 32KB of ROM area which is projected to 000000H ~ 007FFFH for allowing reset start and other vector addressing, or the lower 32KB of ROM area which is projected to 008000H ~ 00FE7FH for allowing 0 page addressing of work RAM area.

(*4) "Expansion I/O" means expansion I/O device area which isaddressed to area other than page 0.

② 0 page memory map

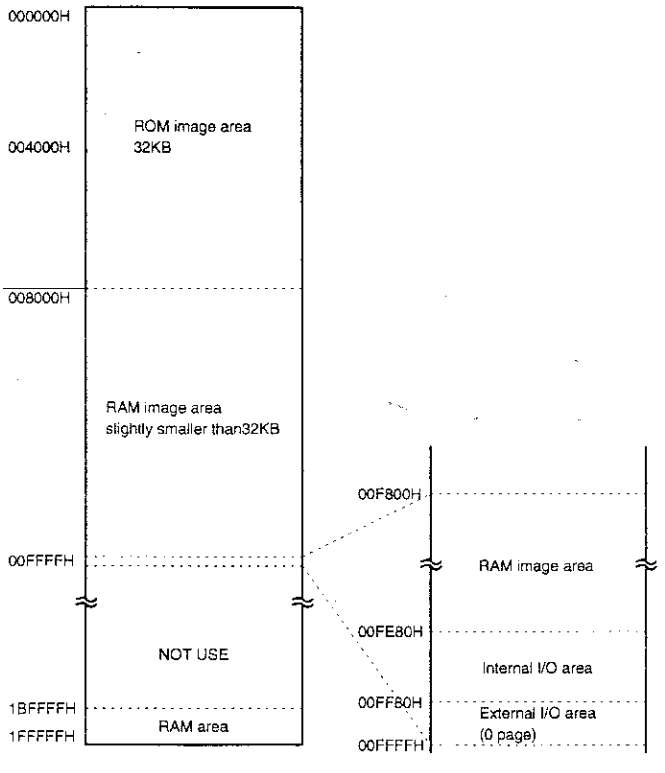


Fig. 5-2

- ROM image area: Image is formed in ROM area address C00000H C07FFFH. This area is identical to IPL ROM area which will beseparately developed.
- RAM image area: Image is formed in RAM area address 1D8000H1DFE7FH. (*Note)

  * Note: Image can be formed in lower 32KB of RAS2.

③ ROM area memory map

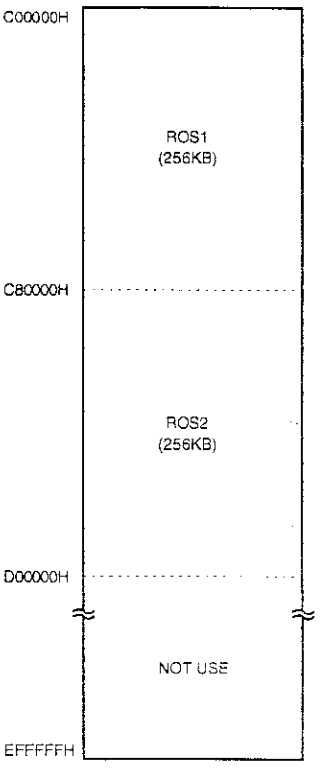


Fig. 5-3

These two decode signals decode 512KB space respectively and canbe used with max. 4MB ROM.

* Note: The lower 32KB of ROS1 signal is formed as OR of image area in 0page.

④ RAM area memory map

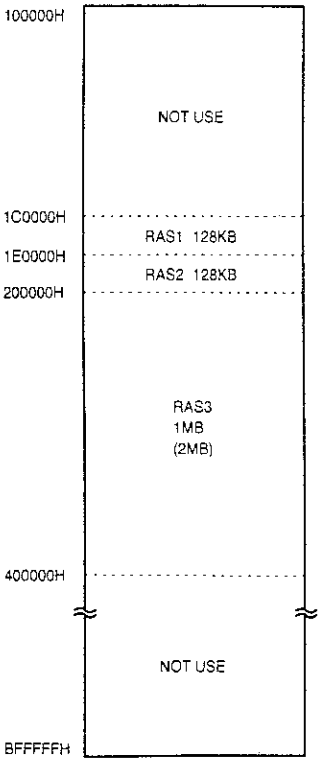


Fig. 5-4

In the three RAM chip select, the following address is decoded.

CS signal	Address
• RAS1	1C0000H~1DFFFFH (008000H~00FE7FH) ✳ Note
• RAS2	1E0000H~1FFFFFH (008000H~00FE7FH) ✳ Note
• RAS3	200000H~3FFFFFH

✳ Base signal is for 2M.

✳ Note: RAS1 signal is formed as OR in the image area of 0 page.j (Lower 32KB).
RAS2 signal is formed as OR in the image area of 0 page. (lower32KB).

⑤ I/O area memory map

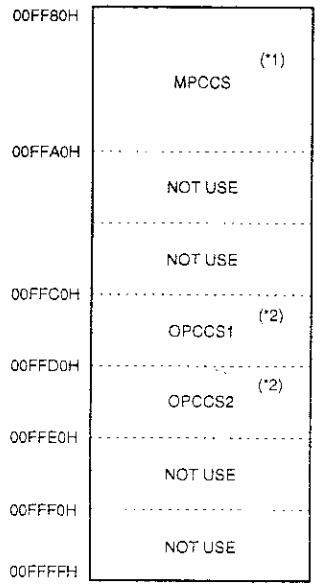


Fig. 5-5

✳ Note 1: MPCCS signal is the base signal for MPCA5 internal registerdecoding, and does not exist as an internal signal.

✳ Note 2: OPCCS1 and OPCCS2 signals are decoded in the OPC (optionperipheral controller) using the base signal OPTCS for optiondecoding. They does not exist as external signals.

2) Block diagram

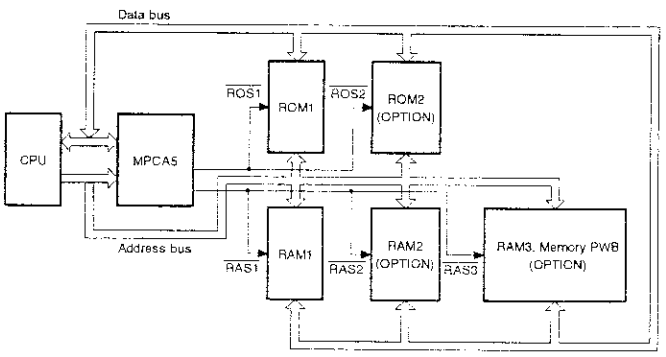


Fig. 5-6

① ROM control

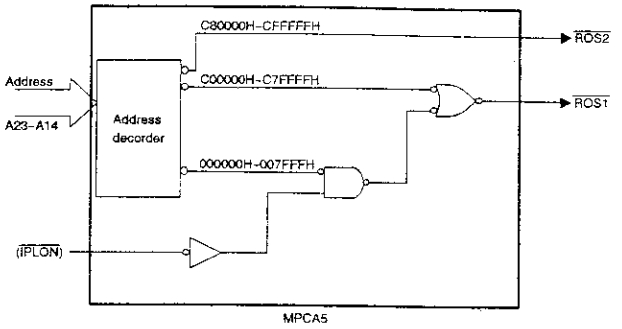


Fig. 5-7

IPLON: IPL board detection signal incorporated in the option slot. Note used in the ER-A650. (Not used)

Access is performed with two ROM chip select signals $\overline{ROS1}$ and $\overline{ROS2}$, which decode 512KB address area respectively to accessmax. 4MB ROM.

② RAM control

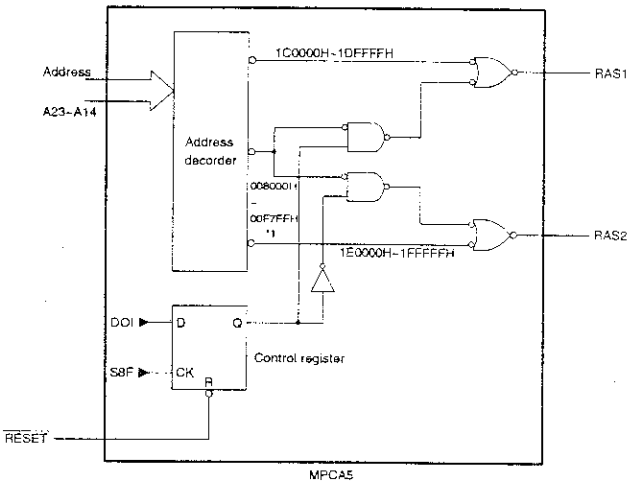


Fig. 5-8

Access is performed with two RAM chip select signals RAS1, RAS2 and RAS3. The control register in MPCA5 allows selection of pageimage memory area. (RAS1 is selected for initializing.)

✳ : For 0 page image area, selection between RAS1 and RAS2 can bemade with the control register. The 0 page control registerperforms initializing at the timing of no stack processimmediately after resetting.

6. SSP circuit

1) Block diagram

This is the circuit employed to do the Special Service Preset(SSP).

(Block diagram)

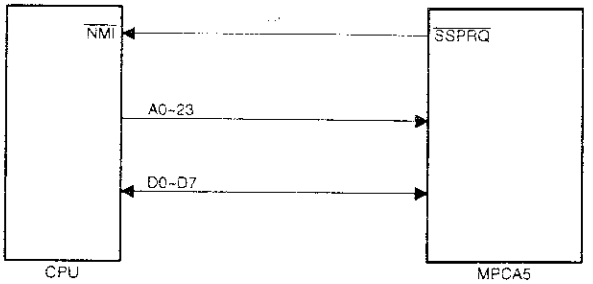


Fig. 6-1

(MPCA5 block diagram)

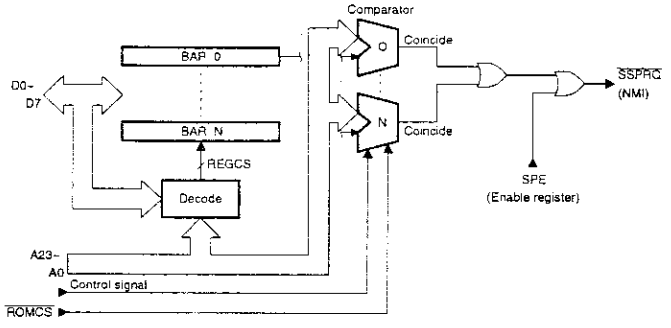


Fig. 6-2

As the address detection system, the brake address register comparison system is employed though the mapping system was employed in the conventional monitor RAM. The address registerlocated in MPCA is always compared with the system address bus to monitor and generate NMI signal at a synchronized timing and togo to NMI exception process.
In the exception process routine service routine, the entry address is checked to go to SSP sub routine.
Entry to the break address register (BAR) is performed through address FFFF00H or later decoded in MPCA5.

2) SSP register

The break address register (BAR) is accessed through direct address of FFFF00H~FFFFFFH. Entry number is 32 entry.

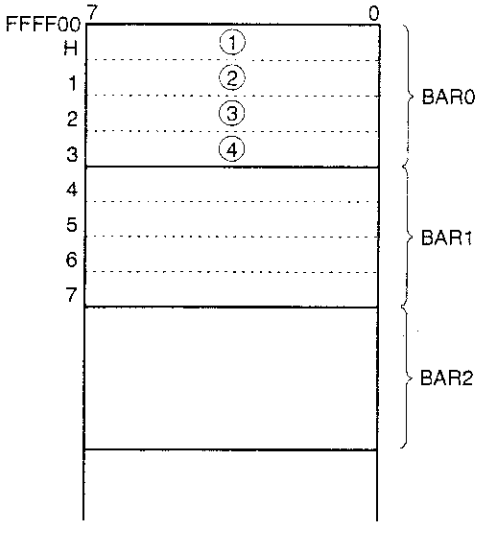
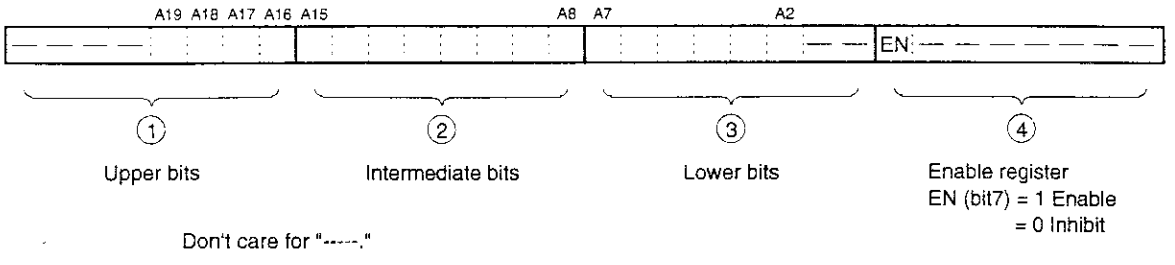


Fig. 6-3

Each BAR is composed of 4 byte address. Bit composition is as follows:



< BAR composition >

Fig. 6-4

④ is the enable register. The entry registers of the break address are assigned to ①, ②, and ③. Each bit of address corresponds to each bit position, writing to ①, ②, and ③ is performed without shifting. The corresponding area is 1MB space of ROS1 and ROS2.

3) SSP register access method

Access to SSP break address register is performed through the temporary register as shown below:

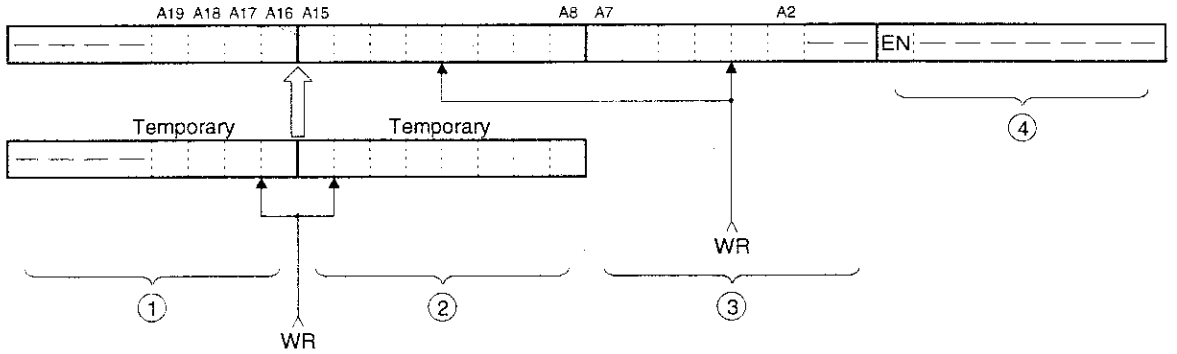


Fig. 6-5

Enable flags can be accessed individually.
Though enable register ④ can be accessed individually, writing to brake address registers ① and ② is performed at the same time as writing to brake address register ③ through the temporary register.
Therefore, set ① and ② to temporary, then write into ③ at last.
Since the temporary register is commonly used by BAR sets, thefollowing register setting is performed after completion ofsetting of each break address register.

③ SSP control method

Access to the enable register and the brake address register is only possible when writing to them from the CPU.

bit 7	6	5	4	3	2	1	0	
0	0	0	CMP4	CMP3	CMP2	CMP1	CMP0	(FFFFFFH)

Information on which brake register the SSP brake is detected in is read as binary data by reading address FFFFFFH (*1).
Used in an expanded register.
Normally is a reserve bit. Whenreading, fixed to 0.

If there are 32 break registers, binary expression is made with the above 5 bits, and 0th is "00000_B" and 31st is "11111_B."

When detected simultaneously by two or more break registers, onewith the smaller BAR number is read as binary data.

The brake signals (NMI) and the above detection data (CMP0~4) areheld until the above detection data are read. So read should bemade in the NMI sub routine. (Clear by FFFFFFH read.)

* 1: FFFFFFH is not fulldecoded. (FFFF00H~FFFFFFH). Therefore,unnecessary read access in parentheses should not be performed.

7. PRINTER control circuit

1)Block diagram

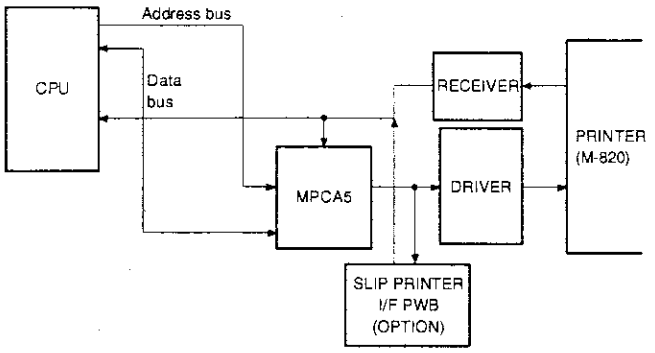


Fig. 7-1

2) General description of the printer controller

The M820 is used as the R/J printer of the body and the M240 is used as the slip printer. The printer mechanical timing control is made by the CPU through MPCA5.

3) Motor drive circuit

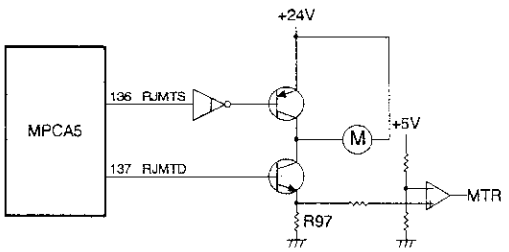
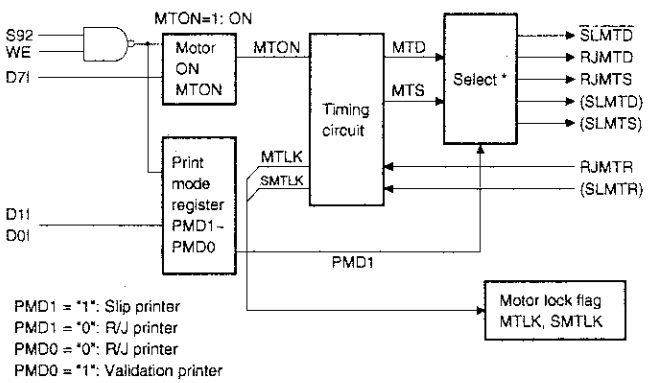


Fig. 7-2



MPCA5 internal circuit

Fig. 7-3

The printer motor ON/OFF control is performed with RJMTD as the drive signal and RJMTS as the brake signal. Motor lock detection is performed as follows:

Check by the hardware: The motor drive current flowing from the MTD transistor is checked across R126. When an overcurrent is detected, the MTR signal becomes HIGH to drive the MTS and MTD signals in the MPCA5 to HIGH impedance to stop conduction of the motor.

When the motor is stopped, the CPU timing pulse width is extended and the CPU judges it as motor lock.

CPU motor lock detection can be read out as internal register MTLK.

Lock can be released by writing dummy data into MTLK as well as by conventional hardware reset.

Check by the CPU: When timing pulse from the printer is not generated for more than the specified time, the CPU judges it as motor lock, the MTON is reset (To High) and the motor is stopped.

4) Printhead mechanism

With the timing plus (TS) from the motor, current is applied to the dot wire drive coil to print.

- Discussion is given here to explain how a single dot wire is driven.

① When current is applied to a coil, the actuator moves towards the arrowhead (a) as the steel core is magnetized. The actuator makes connection with the wire, and the wire pushed out towards the platen.

② As the wire hits the platen with the ink ribbon and paper in-between, a dot is then printed.

③ When current is removed from the coil, the actuator and the wire return to their home positions by means of the actuator spring and wire return spring.

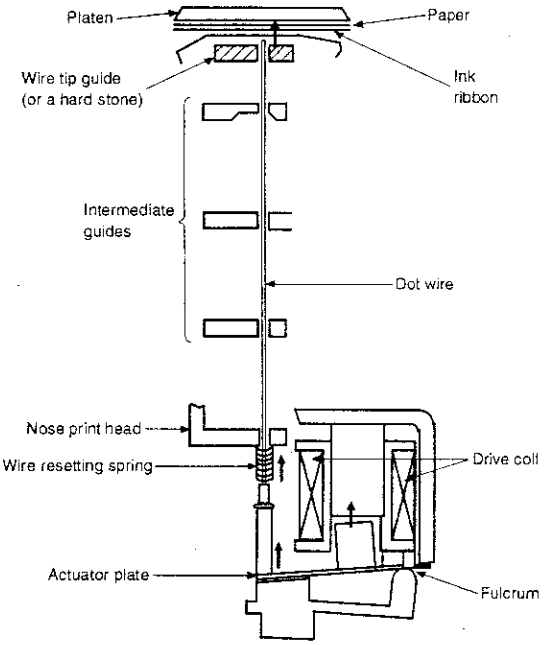
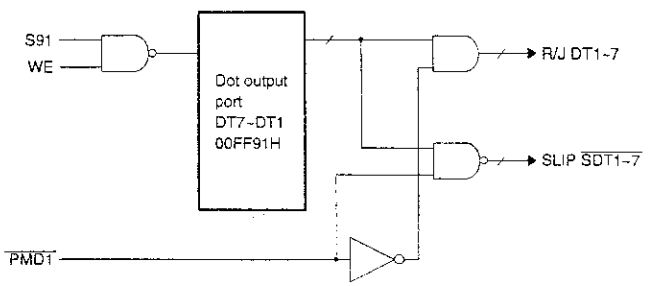


Fig. 7-4

5) Dot wire drive control circuit



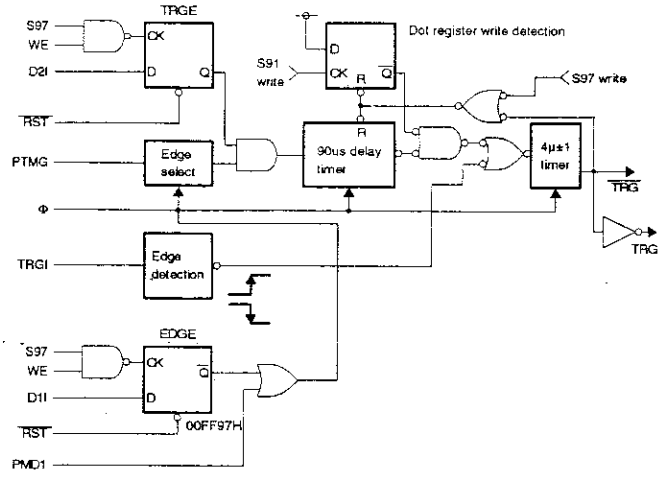
MPCA5 internal circuit

Fig. 7-5

When writing is made into address 00FF91H by the dot register in MPCA5, dot wire drive signals DT1~DT7 are formed.

When $\overline{PMD1}$ is low, the R/J printer is selected.

6) Print trigger generating circuit



MPCA5 internal circuit
Fig. 7-6

- Automatic trigger mode selection register (TRGE)
  TRGE = 1: Automatic trigger generation
  TRGE = 0: Trigger is generated at change edge of OCRA matchoutput.
  (Reset initial value = 0)
- Timing pulse active edge select register (EDGE)
  EDGE = 0: Falling edge
  EDGE = 1: Rising edge
  (Reset initial value = 0)

7) Dot solenoid drivers (solenoid 1 - 7)

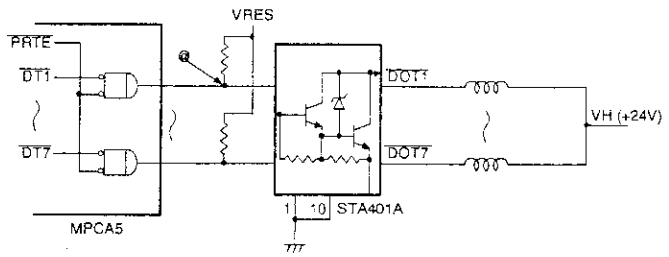


Fig. 7-7

Current to the dot solenoid is controlled in the following manner:

- VRES must be at a high level.
- At the same time $\overline{DTS1}$ is set low, $\overline{TRG}$ must be set low.
- $\overline{PRTE}$ is now set low. (MPCA5)
- PE must be set high level.
- The signal is turned high at point @, the magnet driver output is set low, and then VH flows through the magnet driver.
- The dot wire now protrudes to hit and print.

8) Sensor signal receive circuit

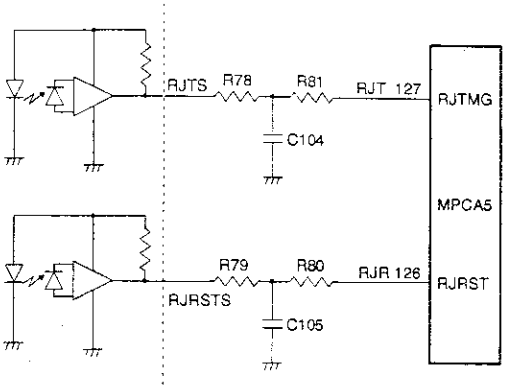
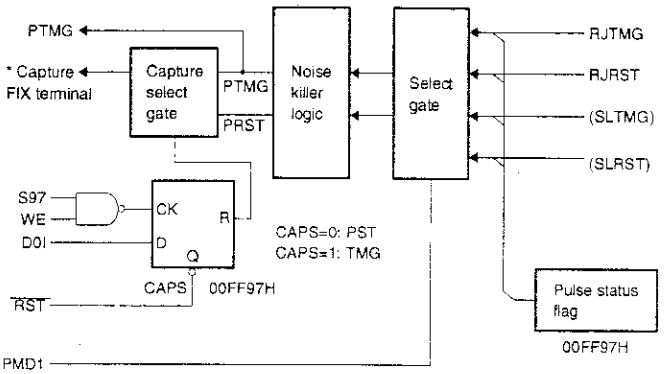


Fig. 7-8
MPCA5 internal circuit



** PRST/PTMG is in the same phase (non-reversion) of RJTMG/RJRST.

Fig. 7-9

The signal from the photocoupler within the printer is converted into TTL level and conveyed to the MPCA5.

9) Paper feed, stamp and cutter circuit

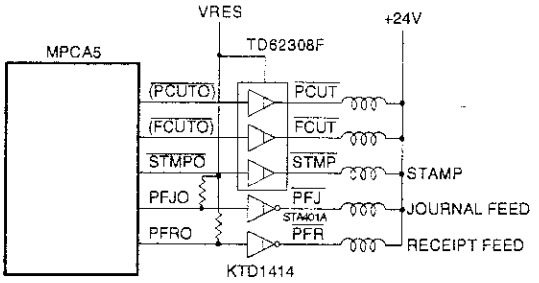


Fig. 7-10

The paper feed/stamp related signals issued from MPCA5 and pulled up by the VRES signal to prevent action when the power supply is not steady.

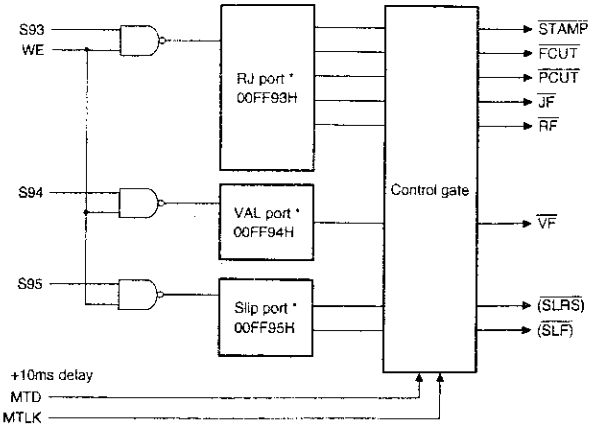


Fig. 7-11

Printer control signals are generated by writing each port address into the register address in PMCA5.

CAUTION

If fuse F2 should be blown, the dot head solenoid may be shorted. Be sure to check the head impedance and driver breakdown.

When fuse F2 is blown:

① Remove F2, and perform the service resetting. The set the mode switch to a position other than SRV and SRV' and turn off the power.

② Install fuse F2 (1.5A)and turn on the power.
If the fuse blows with the above operation, driver STA401A may be shorted.

③ Turn off the power.

④ Disconnect the printer cable from the printer. Measure impedance between the printer body connector pin 21 and the following pins:
18, 20, 24, 25, 28, 29, 30
The impedance must be 12.4 ~ 18Ω.
If impedance is outside the above range, the dot solenoid is bad. Replace the dot head unit.

8. Drawer drive circuit

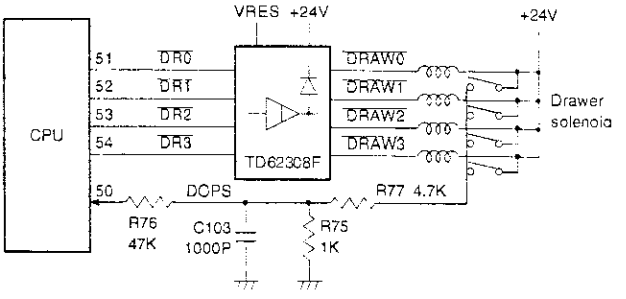
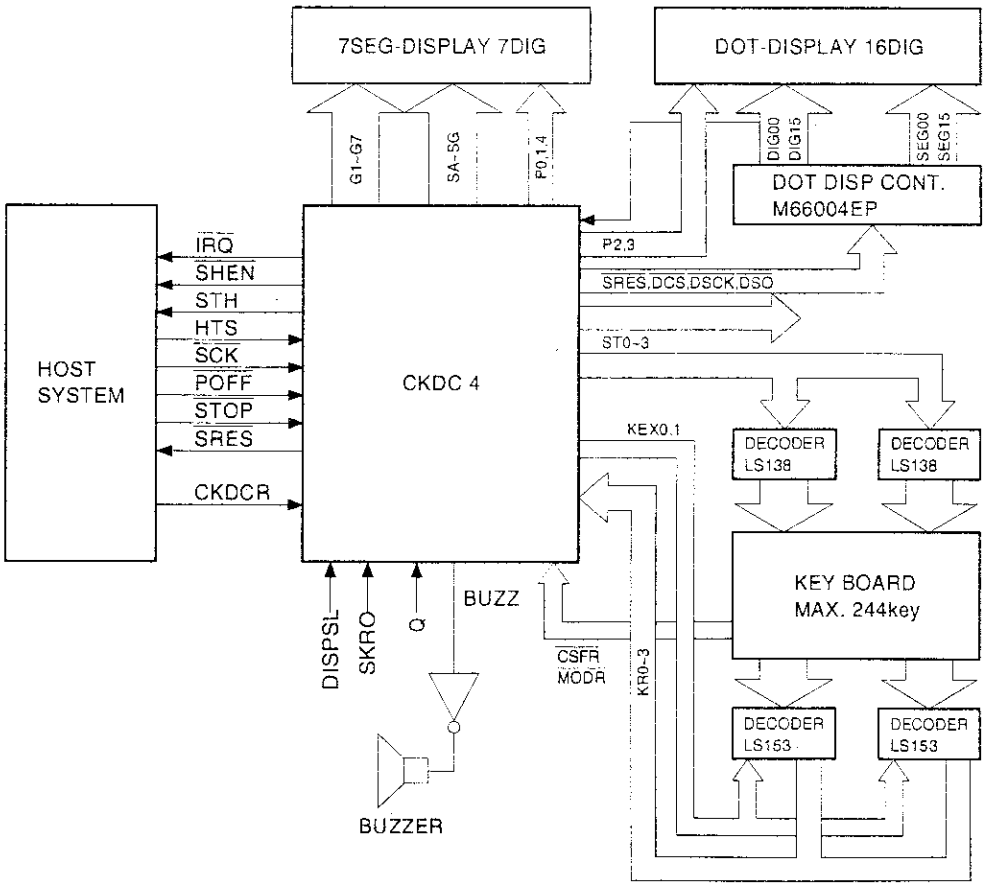


Fig. 8-1

The drawer is directly supported by the CPU. No action starts when the power supply is not steady as the output stage of the driver is pulled VP by VRES signal.
Drawer open and close is sensed with the microswitch provided in the drawer whose signal is level converted with R75 and R77 and directly read by the CPU.

9. Key, display, timer, buzzer controls

The keys, switches, displays, timer/calendar, and buzzer are controlled by the CKDC-4 on the display PWB.



Block diagram
Fig. 9-1

1) Power on/off sequence

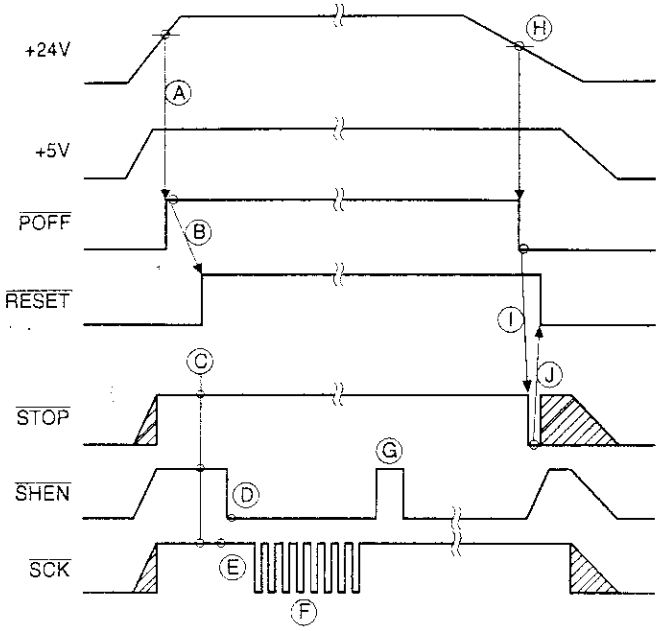


Fig. 9-2

Hatched area indicates logic unstable.

<At power on>

When +24V power rises, the signal $\overline{POFF}$ is forced high (A), by which time the +5V supply becomes stable. The CKDC-III monitors the state of $\overline{POFF}$ while updating the timer/calendar in the low power standby mode, and when the high state of $\overline{POFF}$ is detected, the system reset signal ($\overline{RESET}$) is set high (B), by which time the output lines $\overline{STOP}$ and $\overline{SCK}$ of the CPU and MPCA5 have been initialized to high, respectively (C). Thereafter, the CKDC-III sets $\overline{SHEN}$ active (low) (D) to notify the CPU of the command/data communication ready state.
One byte data/command can be transferred with eight $\overline{SCK}$ pulses (F). When one byte has been transferred with eight $\overline{SCK}$ pulses, the CKDC-III sets $\overline{SHEN}$ high to initiate internal processing. After completion of the internal processing, when the next byte transfer becomes ready, the CKDC-III sets $\overline{SHEN}$ back to a low state to wait for the next byte transfer (G).
Thereafter, the $\overline{SHEN}$ and $\overline{SCK}$ timing described above is repeated to carry on the communication.

<At power off>

When +24V power drops, $\overline{POFF}$ goes low (H).
A low on the $\overline{POFF}$ line causes a low level interrupt request which is sent the $\overline{IRQ0}$ pin of the CPU. Within a maximum of 10msec of the low level $\overline{IRQ0}$ input, the CPU performs software processing necessary for power-off, after which the $\overline{STOP}$ output is set low (I).
When $\overline{STOP}$ goes low, the CKDC-III sets $\overline{RESET}$ low to reset the whole system (J). And, the +5V supply is held at 4.75V or higher voltage, after which the voltage drops to a level that the logic circuit does not operate.

2) Key and switch scanning

Strobes ST0 ~ ST3 are decoded on the keyboard by two 74LS138 3-to-8 decoders to generate 16 strobe signals of $\overline{S15}$ ~ $\overline{S0}$.
The key matrix consists of 16 strobe lines and 16 returns lines of $\overline{KR0A}$, $\overline{KR1A}$, $\overline{KR2A}$, $\overline{KR3A}$, $\overline{KR0B}$, $\overline{KR1B}$, $\overline{KR2B}$, and $\overline{KR3B}$.
To minimize interfacing lines between the CKDCIII and the keyboard unit, two multiplexers (74HC153) are used to multiplex signals by the timing controlled with the signals KEX0 and KEX1 which are sent to the CKDCIII on the return lines of $\overline{KR0}$ ~ $\overline{KR3}$.

Timing ST

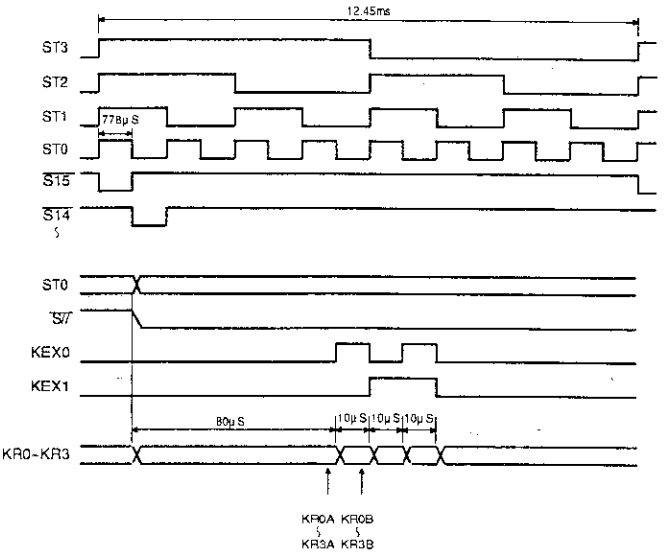


Fig. 9-3

The mode switch in provided with a special return line $\overline{MODR}$, apart from the above return lines.
In the same manner, the clerk, paper feed key (J/R), and receipt on/off switches use $\overline{CFSR}$ as the return line.

3) DISPLAY CONTROL

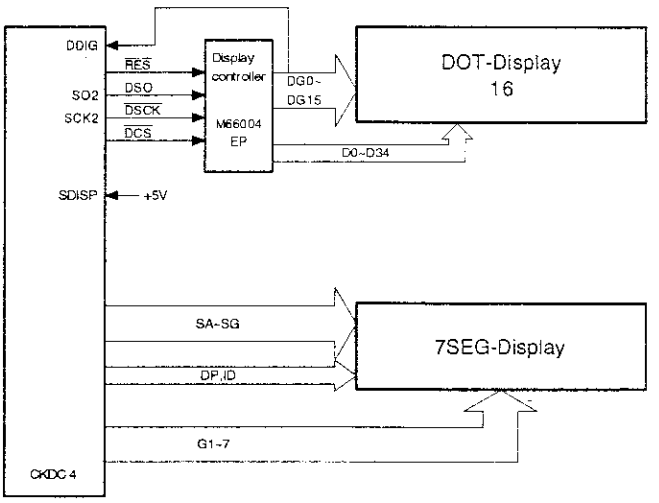


Fig. 9-4

CKDC4 directly drives the 7-segment display unit and the dot display is driven via M66004FP.

<7-segment display>

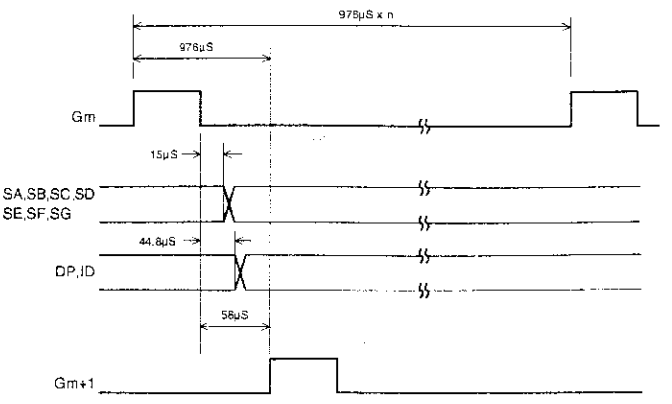


Fig. 9-5

<Dot display>

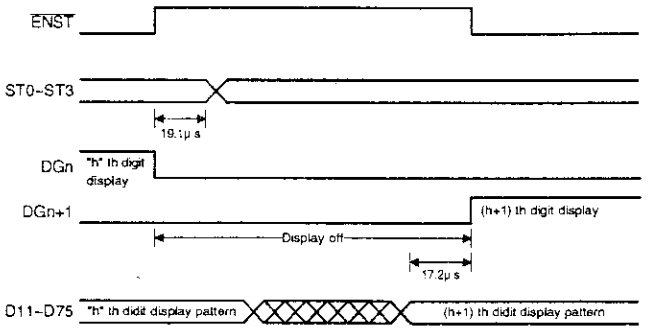


Fig. 9-6

IMPORTANT:

The CKDCIII lines are not high voltage resistive ports. Damage may occur to the CKDC4 if lines are ahorted carelessly when using oscillo-scope probes.

- Dot matrix tube
  A 4-bit binary output signals (ST0-ST3) from CDKC4 are converted into the digit drive signal (DG0-DG15) in the M66004FP.

<Dot display control>

The CKDC4 controls the character segment (5 x 7) and the indicator of the dot display by using the controller (M66004FP) for dot display control.

① M66004PF/Dot display control signal

Signal name	Contents	Pin/Remark
DSO	Serial data output signal for M66004FP	C-MOS pin
$\overline{DSCK}$	Serial shift clock output signal for M66004FP	C-MOS pin. Requires to be pulled up
$\overline{DCS}$	Chip select output signal for M66004FP	C-MOS pin

D0	D1	D2	D3	D4
D5	D6	D7	D8	D9
D10	D11	D12	D13	D14
D15	D16	D17	D18	D19
D20	D21	D22	D23	D24
D25	D26	D27	D28	D29
D30	D31	D32	D33	D34

10. Power supply circuit

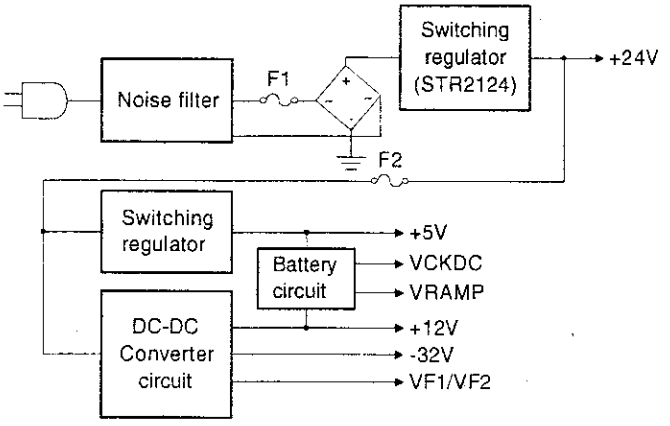


Fig. 10-1

+24V: Printer, solenoid power
+5V: VCC (Logic power)
+12V: Battery charge, IN-LINE driver power
–32V: Display tube power
VF1, VF2: Display tube power (AC)
VRAM: Battery back-uped power
VCKDC: CKDC III Back-up power

For the DC-DC converter, refer to section 8 of cash register Basic manual.

11. Switching regulator circuit

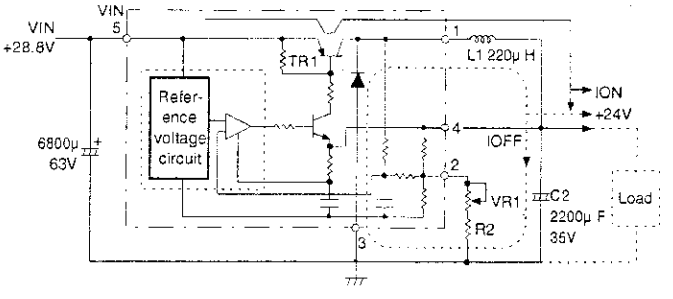


Fig. 11-1

By switching VIN (+28.8V) by the transistor TR1 within the STR2124, DC+24V supply is obtained through the LC network. Stable +24V is obtained by controlling on/off duty of TR1.

ION: Current when TR1 is on.
IOFF: Current when TR1 is off.

CHAPTER 5. TEST FUNCTION

1. General

1) This diagnostic program has been developed for diagnosing machine functions in the field. The program is contained with in the ER-A570.
The diagnostic program is stored in the external ROM which will be executed by the CPU (H8/510) which requires the following diagnostic operations:

   a) Proper power supply voltages are mandatory for logic circuits (+5V, VRAM, VCKDC, POFF, 12V, +24V).

   b) CPU input/output pins, CPU internal logic, CKDC4, MPCA5, TPRC, address decoder, address bus, data bus, and common ROM/RAM must be working properly.

2. Operational procedure

To start the diagnostic program, you must enter the following command.
3-digit test item number → [TL] key in the SRV mode.
The key assignment must be properly set and a part for ROM and RAM must be operating properly to go into this mode because the control jumps to the program area in the SRV mode. A master reset must be performed before operating the ECR for the first time. After any option is installed, a program reset is required. When the master reset or program reset is performed, be sure to check the printout on the journal paper.

Master reset:	Turn power on in the SRV' mode and change it to the SRV mode with the [JF] key pressed.
Journal print:	MASTER RESET ***
Program reset:	Turn power on in the SRV' mode and change it to the SRV mode.
Journal print:	PRG. RESET ***

3. Test command list

With the SRV mode and the following command entry, the test starts.

Code	Description
100	Display test-1
101	Key, clerk, and switch position code display
102	R/J printer test
103	Slip printer test
104	Keyboard test
105	Mode switch test
106	Validation sensor and near end sensor test
107	BOF, TOF and IFV test
108	Calendar oscillator test
109	SSP test
110	Drawer-1 open and sensor test
111	Drawer-2 open and sensor test
112	Drawer-3 open and sensor test
113	Drawer-4 open and sensor test
116	Display test-2
117	SIO test-1
120	Standard RAM test
130	Standard ROM test
150	R/J printer dot pulse width adjustment
200 ~ 206	Option RAM chip test
300 ~ 306	Option RAM address test
400	Option ROM test

[1] Display test-1

① Key operation
100 → [TL]

② Functional description
The following is displayed:

DOT DISPLAY : 0123456789:ABbC

POP-UP DISPLAY: 4,5,6,7,8,9,-,

③ Check the following items:

   a) Check for proper activation of display elements.

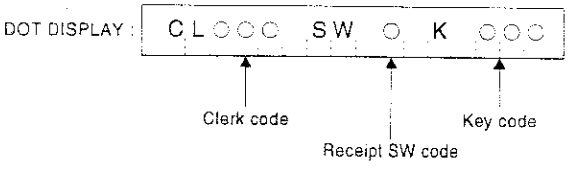
   b) Check for blur, uneven illumination, and partial omission.

④ Test termination
Press any key. The test terminates with the test and message printed.

100
Test termination print

[2] Key, cashier, and switch position code display

① Key operation
101 → [TL]



② Functional description
Key, clerk, and receipt switch codes are displayed.

③ Check the following items:
Change key and switch positions for proper display activation.

Clerk code:	1 hole clerk key or WMF clerk key 000 (off state) 001 (Clerk 1) 002 (Clerk 2) ~ 255 (Clerk 255)
Receipt switch code:	0 (on state) 1 (off state)
Key code:	--- (simultaneous two key depression, invalid entry) 001 ~ 158

NOTE: Refer to JOB#104, key soft code, for the key code. (Fig. 3-2.)

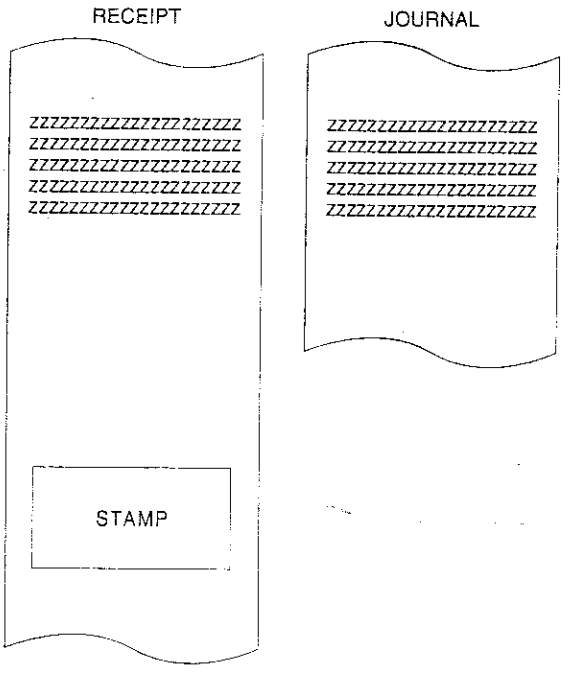
④ Test termination
Change the MODE switch position other than SRV position to terminate the test. The test termination message is printed.

101
Test termination print

[3] R/J printer test

① Key operation
102 → TL

② Content
Five lines of "Z" characters are printed as follows on the receipt and the journal regardless of receipt (ON/OFF) switch setting.



③ Check content

1. Check that the slanted lines of "Z" characters are clearly printed.
2. Check that the characters are printed at a uniform density.
3. Check the paper feed operation and the logo print.
4. Check partial cut and full cut.

④ Termination
This check is terminated automatically.
The termination print is not performed.

[4] Slip printer test

① Key operation
As slip must be set on the print table.
103 → TL

② Functional description
Regardless of paper setting, 35 digits of "Z" are printed on five lines, then the printer stops after releasing the paper.

③ Check the following items:
a) Print starting position must line up in the same column.
b) Check the print quality.
c) Make sure that the paper is released at the terminattion.

<Print sample>

ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ

④ Test termination
The test terminates automatically. If the paper release lever is not up, perform JOB#107 BTF, IFV test to release the paper.

If the ER-31SP (printer and I/F PWB unit) is not connected when performing this test, the following error display is made.
To cancel the error state, press any key or shift the mode key position, and the R/J printer will print the error print, terminating the operation.

Error display:

DOT DISPLAY : SLIP I/F ERR

Error print:

R/J printer:	E-----	103

[5] Keyboard test

① Key operation
104 → TL

② Functional description
Key actions of the standard version ER-A610 are tested.
Press keys on the keyboard in the order given in the figure 3-1. If the test has been successful, the test terminates with the printout showing correct action of every key. If an error has occured in the course of a test, an error message will be printed immediately upon occurrence of the error. When the test is interrupted, the normal test termination printout is not produced.

③ Check the termination print

④ Test termination
When the last key (see next page) is depressed, the test terminates with the termination printout.

104	E--###	104
Test termination print	Error print	

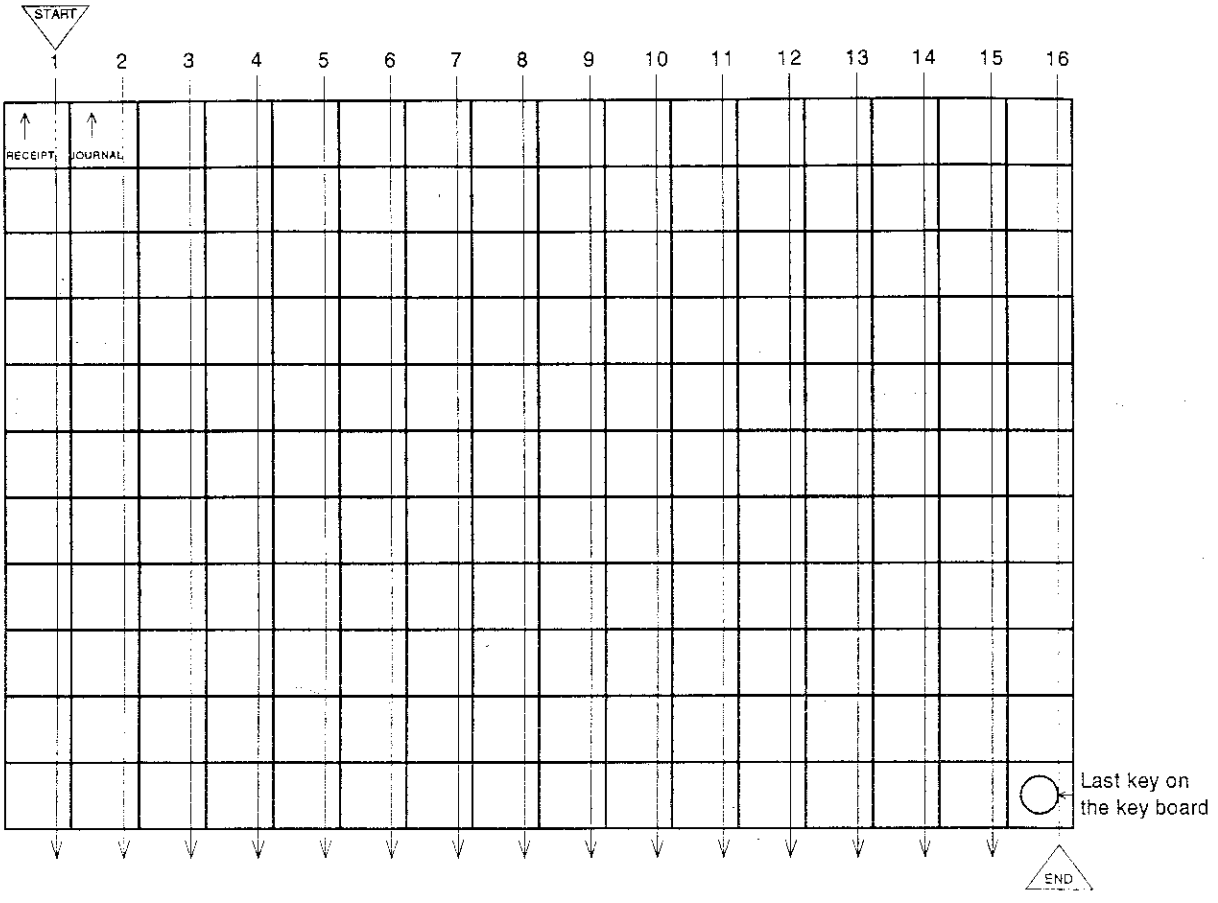
###: Key code that caused the error

(Additional description on the program specifications)
When an error occurs during check, the operation is not terminated and the key to be checked on the key table is not incremented and is kept at standby state for being checked.
To terminate compulsorily, press the END key (at the right bottom). In this case also, the error print is not made.
The display specification is as follows:

DOT DISPLAY : KEY-BOARD ○○○

Key code

[ER-A570]



Note: The receipt feed key and the journal feed key are excluded from this test.

Fig. 3-1: TEST SEQUENSE

↑ RECEIPT	↑ JOURNAL	028	038	048	058	068	078	088	098	108	118	128	138	148	158
009	018	027	037	047	057	067	077	087	097	107	117	127	137	147	157
008	017	026	036	046	056	066	076	086	096	106	116	126	136	146	156
007	016	025	035	045	055	065	075	085	095	105	115	125	135	145	155
006	015	024	034	044	054	064	074	084	094	104	114	124	134	144	154
005	014	023	033	043	053	063	073	083	093	103	113	123	133	143	153
004	013	022	032	042	052	062	072	082	092	102	112	122	132	142	152
003	012	021	031	041	051	061	071	081	091	101	111	121	131	141	151
002	011	020	030	040	050	060	070	080	090	100	110	120	130	140	150
001	010	019	029	039	049	059	069	079	089	099	109	119	129	139	149

Fig. 3-2: KEY CODE TABLE

[5] Mode switch test

① Key operation
105 → TL

② Functional description
This test is applicable for checking of the MODE switch. The MODE switch must be changed as described below to do the test.
Initial state mode: SRV mode
Mode check
Change the MODE switch position in the order given below starting from the SRV position.

DOT DISPLAY : MODE SWITCH X

X: 0-7,E,F

Mode:	SRV	PGM2	PGM1	⏻	OP X/Z	REG
X :	0	1	2	(E)	3	4

SRV	X2/Z2	X1/Z1	MGR
0	7	6	5

(X: E-intermediate position, F-multiple errors)

When the mode key settings in the sequence other than specified is met or when any key pushed, the program execution will terminate immediately upon occurrence, with the error printout produced, except for the mode switch in the middle position. To avoid this, the mode switch must be rotated correctly. Because nothing is interrogated until the mode key returns to the SRV position once after the switch has turned to the "X2/Z2" positions, it needs not to be rotated slowly.

③ Check the following items:
Check to see if the following are displayed and that the termination print is produced

④ Test termination
When the test has been completed according to the given procedure, the test automatically terminates with the termination message printed. To terminate the test in the middle of an operation, merely depress any key, then, the test will terminate with the error message printed. When an error was encountered, the test automatically terminates with the error message printed on the printer.

105	E---- 105
Test termination print	Error print (any key depression)

[6] Validation sensor and near end sensor test

The validation sensor and the near end sensor are optional units.

① Key operation
106 → TL

② Functional description
State of the validation and near end sensor is sensed and displayed.

③ Check the following items:
On and off actions of the validation and near end sensors are tested and their results are displayed.
ON/OFF check is performed for VDS and NES and the display is checked.

DOT DISPLAY : VDS x y NES z

x: State of the VDSR sensor
y: State of the VDSJ sensor
z: State of the NES sensor

Display	X/Y/Z	Description
VDSR	O	Validation sensor (JOURNAL) not detected
	C	Validation sensor (JOURNAL) detected
VDSJ	O	Validation sensor (RECEIPT) not detected
	C	Validation sensor (RECEIPT) detected
NES	O	Journal side paper roll near end detected.
	C	Journal side paper roll near end not detected.

NOTE: "C" is always displayed when no sensor is used.

④ Test termination
Any key depression causes the test to terminate with the termination message on printout.

106
Test termination print

[7] BOF, TOF and IFV test

① Key operation
107 → TL

② Functional description
After releasing the paper, the state of BOF, TOF, and IFV sensor are sensed and displayed.

③ Check the following items:
BOF, TOF: Check the paper set condition.
IFV: Check the connection of the ER-31SP slip printer and slip printer interface.
Check the on and off actions.

DOT DISPLAY : IFV z BTF x y

x: State of IFV
y: State of the BOF sensor
z: State of the TOF sensor

Display	x/y	Description
IFV	O	Slip printer or slip printer interface not in connection
	C	Slip printer or slip printer interface in connection
BOF	O	Slip paper not detected
	C	Slip paper detected
TOF	O	Slip paper not detected
	C	Slip paper detected

④ Test termination
Any key depression terminates the test with the termination print.

107
Test termination print

Note 1: Before performing this test, connect the slip printer and the slip printer I/F. If not, "SLIP I/F ERR" occurs.
Note 2: Before turning on/off the connector for IFV checking, be sure to set the mode to other than SRV and turn off the power.

[8] Calendar oscillator test

① Key operation
108 → TL
Functional description
This program is used to test the calendar oscillator function.

DOT DISPLAY : T I M E R C H E C K

POP UP DISPLAY : * * - * *

-: Present time

② Check the following items:
i) Testing blinking "~". (500ms ON and OFF)

③ Test termination
Any key depression terminates the test with the termination print.

108
Test termination print

[9] SSP test

① Key operation
109 → TL

② Functional description
If an SSP is programmed, its contents are automatically checked and the result is printed.

③ Check the following items:
Check printing of the termination message.

④ Test termination
The test terminates automatically after printing the termination print.

109	E - - - - - 109	F - - - - - 109
Normal end print	Error print	SSP table full print (NOTE)

Note: In this SSP check, set the data for check in the empty area of SSP entry REG and erase the data for check after completion of check. Therefore, SSP setting before check is not cleared. If, therefore, there is no SSP entry REG remained for SSP check, F-print (SSP entry register full print) is performed to terminate the program without check.

[10] Drawer open sensor test

① Key operation
110~113 → TL

② Functional description
The drawer indicated by the job number is opened to check the proper action.
Drawer opened: O indicated
Drawer closed: C indicated
110: Drawer-1: Option drawer
111: Drawer-2: Remote drawer
112: Drawer-3: Remote drawer

DOT DISPLAY : D R A W E R x y

x: 1~4
y: O= Drawer opened
C= Drawer closed

113: Drawer-4: Remote drawer

③ Check the following items:
a) Check opening of the specified drawer.
b) Check the display indication when the drawer is open and close.

④ Any key depression terminates the test with the termination print.

11X	
Test termination print	X: 0~3

[11] Display test-2

① Key operation
116 → TL

② Functional description
The display CGs in CKDC4 are checked. The 256 CGs are grouped into 32 blocks and each 8 characters is displayed on the dot display.
The check start with CG code 00H - 07H, and the following blocks are sequentially displayed when any key is pressed.

DOT DISPLAY : x y : O O O O O O O O

O: CG display position
xy: The initial code of each block is displayed in hexadecimal (For example, A0, B8)

③ Check the following items.
1. Check that the display is normal.
2. Check that there is no blur, defects, and unevenness.

④ Test termination
To terminate the test, set the mode key to any mode other than SRV mode.

116
Test termination print

[12] SIO test-1

① Key operation
117 → TL

② Functional description
The following two kinds of loopback tests are carried out using the special service tool (UKOG-6704RCZZ) to check the trans and receive data, ready, and not ready signals.
Test-1: Checks ER – DR, RS-CD and RR-CS
Test-2: Checks TXD – RXD

③ Check the following items:
Successful test results must be checked on the display and the termination message print.

④ Test termination

117	EX - - - - 117
Termination print	

X = 1: Non connect error
2: Verify error
3: Hardware error
4: P-OFF
5: Timer overflow error

[13] Standard RAM test

① Key operation
120 → TL

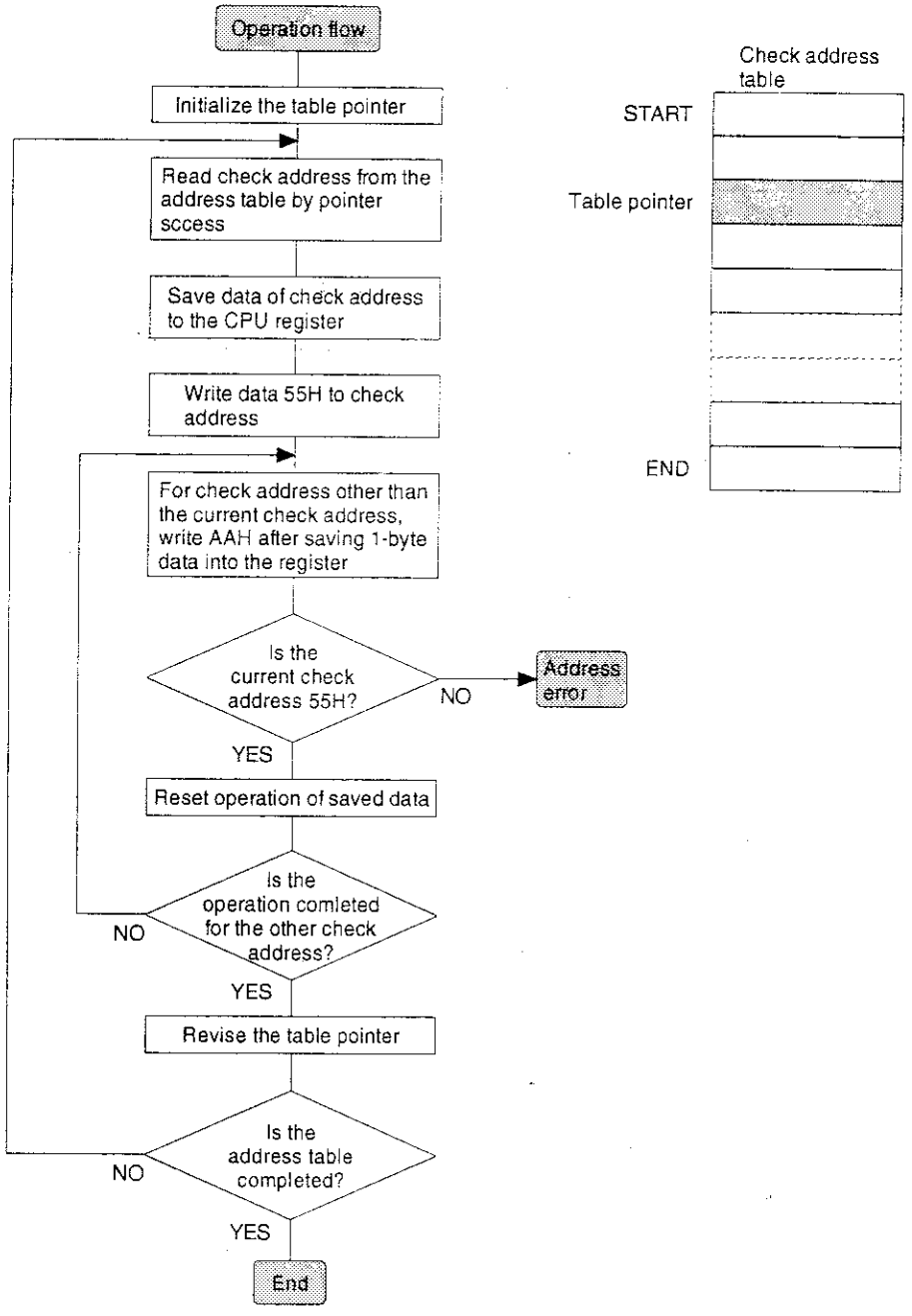
② Functional description
Perform the following check for the standard RAM 128 KByte SRAM. The memory contents should not be changed before and after the check.

Perform the following processes for memory address to be checked (1C0000H~1DFFFFH).
PASS1: Save memory data.

PASS2: Write data "0000H."
PASS3: Read and compare data "00H," write data "55H."
PASS4: Read and compare data "55H," write data "AAH."
PASS5: Read and compare data "AAH."
PASS6: Restore the memory data.

If a comtare error occurs in the check sequence PASS1-PASS6, an error print is made. If no error occurs through all address, the check ends normally.

The following address check is performed further.
Check point address = 1C0000H, 1C0001H
1C0002H, 1C0004H
1C0008H, 1C0010H
1C0020H, 1C0040H
1C0080H, 1C0100H
1C0200H, 1C0400H
1C0800H, 1C1000H
1C2000H, 1C4000H
1C8000H, 1D0000H


Operation flow
Initialize the table pointer
Read check address from the address table by pointer sccess
Save data of check address to the CPU register
Write data 55H to check address
For check address other than the current check address, write AAH after saving 1-byte data into the register
Is the current check address 55H?
NO
Address error
YES
Reset operation of saved data
Is the operation comleted for the other check address?
NO
YES
Revise the table pointer
Is the address table completed?
NO
YES
End
Check address table
START
Table pointer
END

③ Check the following items:
Check the termination printout.

④ Test termination
The test terminates after printing the termination printout.
Termination printout:

Normal termination		120
Abnormal termination	Ex - - - - -	120
		※※※※※

X = 1: Data check error
2: Address check error

Note: When an error occurs, the error print is performed and the check is terminated. The error occurrence address is shown in hexadecimal at positions shown with ※※※※※.

[14] Standard ROM test

① Key operation
130 → TL

② Functional description
Sum check of the standard ROM (C00000H - C7FFFFH) is performed. If the lower two digits of SUM is 10H, it is normal.

DOT DISPLAY : S T R R O M

③ Check the following items:
Check the printout after the test.

④ Test termination
The test automatically terminates with termination message.

Normal termination print		130
	S-ROM	27040※※※※※
		※※※※※
Error termination print	E - - - -	130
	S-ROM	27040※※※※※
		※※※※※

Note: "※※※※※" means the ROM version number.
The underlined section (10 bytes) of code table is provided in the ROM as a standard and the table content is always printed.
The table position is the upper 10 digits of the ROM address.
The check sum correction address is the last address -0FH.

Note: In the case of the ER-ROM, the ROM version number is displayed in the upper and the lower stages.
In the case of the MASK-ROM (future specification), the MASK ROM code is displayed in the upper stage, and the ROM version number is displayed in the lower stage.

	130
S-ROM	27040RAJ1A
	RAJ1A
	400
O-ROM	27020RAP1A
	RAP1A

[15] R/J printer dot pulse width adjustment

The dot pulse width adjust circuit is provided to control the width of the current applied to the dot head of the printer KI-OB6753RCZZ, according to a supply voltage fluctuation.
When the circuit is changed with a new one for such as a repair work, the dot pulse width needs to be adjusted using the 200K pot VR1.

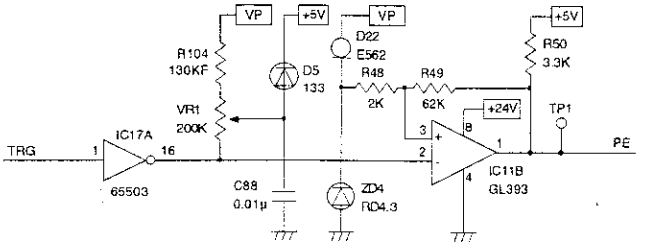


Fig. 3-3

Dot pulse adjusting method

1. Turn power on.
2. Measure the voltage of the VP line between the fuse F1 and GND. Use a digital voltmeter capable of measuring 100mV steps.
3. Set the MODE switch to the SRV position and start the diagnostic program Job #150 with the next command procedure.
   150 → TL
4. Adjust pulse width of TPW at the test point TP1 as shown in the graph in Fig.3. The pulse width of TPW can be adjusted using the 200K pot VR1.
5. To terminate the diagnostic program, just press any key.

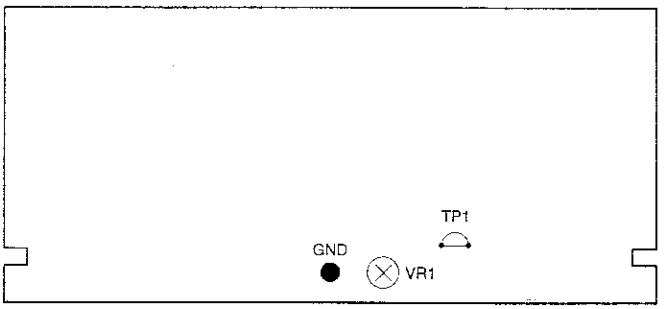
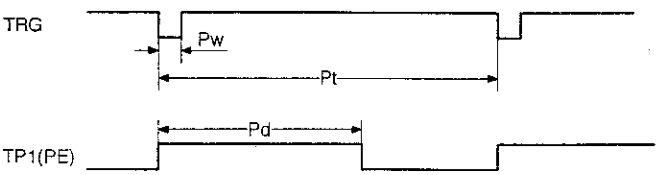


Fig. 3-4



Pw ≒ 4μsec
Pt ≧ 1000μsec
Pd is adjusted to 518 usec when Vp is +24.0V.

Fig. 3-5

✳ For the adjustment of VP, refer to CHAPTER 7. SERVICE PRECAUTION. (Printer printing speed adjustment)

[16] Option RAM test

① Key operation
20X → TL

JOB #NO.	RAM NO.	Memory to be checked	Address area to be checked
200	Option RAM (main)	ER-01RA	1E0000H ~ 1E7FFFH
201	Option RAM (main)	ER-02RA	1E0000H ~ 1FFFFFH
202	ER-01MB RAM1	ER-02RA+ER-01MB	1E0000H ~ 21FFFFH
203	ER-01MB RAM2	ER-02RA+ (ER-01MB+ER-02RA)	1E0000H ~ 23FFFFH
204	ER-01MB RAM3	ER-02RA+ (ER-01MB+ER-02RAX2)	1E0000H ~ 25FFFFH
205	ER-01MB RAM4	ER-02RA+ (ER-01MB+ER-02RAX3)	1E0000H ~ 27FFFFH
206	ER-02MB	ER-02RA+ER-02MB	1E0000H ~ 2FFFFFH

② Content
The following check are performed for the optional RAM.
The following process is performed for memory address to be checked.

PASS1: memory data save
PASS2: Data "00H" write
PASS3: Data "00H" read and comparison, data "55H" write
PASS4: Data "55H" read and comparison, data "AAH" write
PASS5: Data "AAH" read and comparison
PASS6: Memory data restore

If a compare error is found in the check sequence from PASS1 to PASS6, error print (error code E1) is performed. If there is no error found to the end of the last address, the operation is completed normally.

Then the following address check is performed by judging the option chip to be integrated. The check point addresses are as follows:

Check Address	JOB200	JOB201	JOB202	JOB203	JOB204	JOB205	JOB206
1E0000H	O	O	O	O	O	O	O
1E0001H	O	O	O	O	O	O	O
1E0002H	O	O	O	O	O	O	O
1E0004H	O	O	O	O	O	O	O
1E0008H	O	O	O	O	O	O	O
1E0010H	O	O	O	O	O	O	O
1E0020H	O	O	O	O	O	O	O
1E0040H	O	O	O	O	O	O	O
1E0080H	O	O	O	O	O	O	O
1E0100H	O	O	O	O	O	O	O
1E0200H	O	O	O	O	O	O	O
1E0400H	O	O	O	O	O	O	O
1E0800H	O	O	O	O	O	O	O
1E1000H	O	O	O	O	O	O	O
1E2000H	O	O	O	O	O	O	O
1E4000H	O	O	O	O	O	O	O
1E8000H	—	O	O	O	O	O	O
1F0000H	—	O	O	O	O	O	O
200000H	—	—	O	O	O	O	O
210000H	—	—	O	O	O	O	O
220000H	—	—	—	O	O	O	O
240000H	—	—	—	—	O	O	O
260000H	—	—	—	—	—	O	O
280000H	—	—	—	—	—	—	O

"O" in the table shows that the check point address in the horizontal column is valid, and "—" shows it is invalid.
When any error occurs in this address check, error code E2 is printed.

③ Check the following items.
Check the termination print.

④ Test termination
The test terminates after printing the termination printout.

Termination print

Normal termination		20X
Abnormal termination	EY- - - -	20X
		※※※※※※

20X: JOB # (200~206)
Y: Error code

Note: When an error occurs error print is performed and the error address is displayed in position ※※※※※※ in hexadecimal.

[17] Option RAM address test

① Key operation
30X → TL (X: 0~6)

JOB #NO.	RAM NO.	Memory to be checked	Address area to be checked
300	Option RAM (main)	ER-01RA	1E0000H ~ 1E7FFFH
301	Option RAM (main)	ER-02RA	1E0000H ~ 1FFFFFH
302	ER-01MB RAM1	ER-02RA+ER-01MB	1E0000H ~ 21FFFFH
303	ER-01MB RAM2	ER-02RA+ (ER-01MB+ER-02RA)	1E0000H ~ 23FFFFH
304	ER-01MB RAM3	ER-02RA+ (ER-01MB+ER-02RA×2)	1E0000H ~ 25FFFFH
305	ER-01MB RAM4	ER-02RA+ (ER-01MB+ER-02RA×3)	1E0000H ~ 27FFFFH
306	ER-02MB	ER-02RA+ER-02MB	1E0000H ~ 2FFFFFH

② Functional description
The following check are performed for the optional RAM. Do not change.

Check Address	JOB300	JOB301	JOB302	JOB303	JOB304	JOB305	JOB306
1E0000H	O	O	O	O	O	O	O
1E0001H	O	O	O	O	O	O	O
1E0002H	O	O	O	O	O	O	O
1E0004H	O	O	O	O	O	O	O
1E0008H	O	O	O	O	O	O	O
1E0010H	O	O	O	O	O	O	O
1E0020H	O	O	O	O	O	O	O
1E0040H	O	O	O	O	O	O	O
1E0080H	O	O	O	O	O	O	O
1E0100H	O	O	O	O	O	O	O
1E0200H	O	O	O	O	O	O	O
1E0400H	O	O	O	O	O	O	O
1E0800H	O	O	O	O	O	O	O
1E1000H	O	O	O	O	O	O	O
1E2000H	O	O	O	O	O	O	O
1E4000H	O	O	O	O	O	O	O
1E8000H	—	O	O	O	O	O	O
1F0000H	—	O	O	O	O	O	O
200000H	—	—	O	O	O	O	O
210000H	—	—	O	O	O	O	O
220000H	—	—	—	O	O	O	O
240000H	—	—	—	—	O	O	O
260000H	—	—	—	—	—	O	O
280000H	—	—	—	—	—	—	O

"O" in the table shows that the check point address is valid, and "—" shows that it is invalid.

③ Check the following items.
Check the termination print.

④ Test termination
The test terminates after printing the termination printout.

Termination printout

Normal termination		30X
Abnormal termination	EY- - - -	30X
		※※※※※※

30X: JOB# (300~306)
Y: Error code

Note: When an error occurs error print is performed and the error address is displayed in position ※※※※※※ in hexadecimal.

[18] Option ROM test

① Key operation:
400 → TL

② Functional description:
A sum check is done for the option ROM (Address hex C80000H thru CBFFFFH.)

DOT DISPLAY : O P T R O M

③ Check the following items:
Check the termination printout.

④ Test termination:
The test terminates after printing the termination printout.
Termination printout

Normal termination		400
	O-ROM	27020※※※※※
		※※※※※
	E- - - - -	400
	O-ROM	27020※※※※※
		※※※※※

The underlined section must be the same as the standard ROM test specification. (Refer to JOB #130.)

CHAPTER 6. DOWN LOAD FUNCTION

1. General

RAM data can be transmitted in the following two methods.
Save the data before servicing as follows:

① ECR ←——→ ECR

- Cable: ER-A5CB

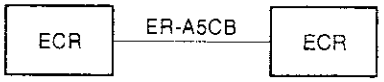


Fig. 1-1

② ECR ←——→ ER-02FD

- Cable: Cable (QCNW-7578RCZZ) packed with the ER-02FD

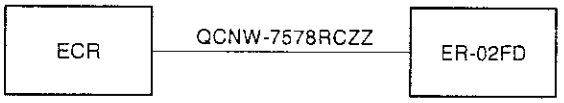


Fig. 1-2

2. SIO interface specification

1) Operation:	Simplex
2) Line configuration:	Direct connect
3) Data rate:	19200, 9600, 4800, 2400, 1200, 600, 300BPS (Selected by SRV JOB#903-A)
4) Sync mode:	Asynchronous
5) Checking:	Vertical parity (odd)
6) Code:	7 bits (ASCII)
7) Bit sequence:	LSB first
8) Line level:	TTL level
9) Data forma:	

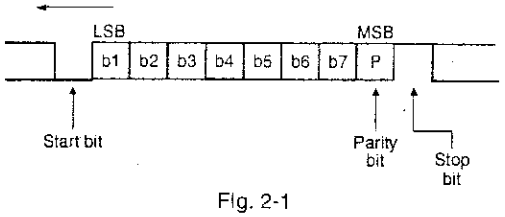


Fig. 2-1

3. Location of connector pins

① ER-A5CB

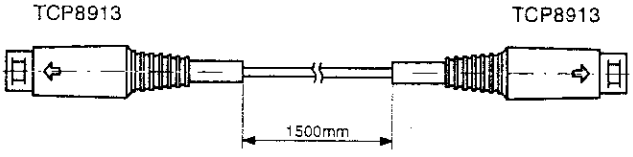


Fig. 3-1

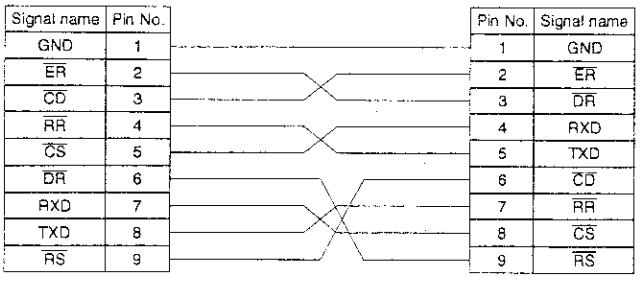


Fig. 3-2

② QCNW-7578RCZZ

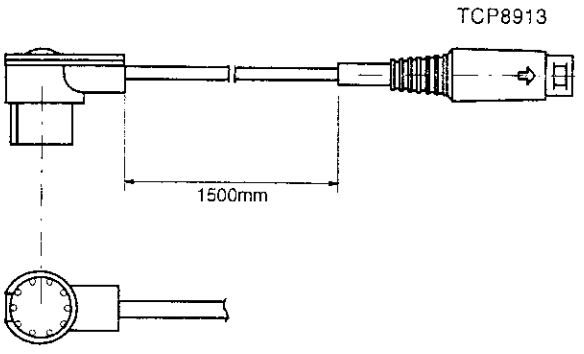


Fig. 3-3

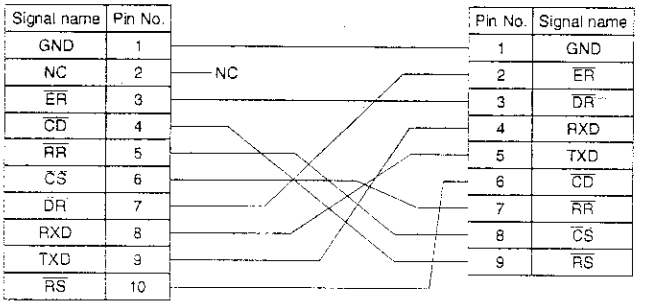


Fig. 3-4

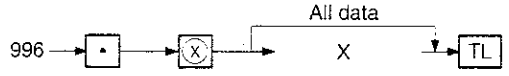
Interfacing signals

Pin No.	Signal name	In/Out	On level	Description
1	GND	—	—	Signal ground
2	$\overline{ER}$	Out	Low	Equipment ready
3	$\overline{DR}$	In	Low	Data set ready
4	RXD	In	High: MARK Low: SPACE	Receive data
5	TXD	Out	High: MARK Low: SPACE	Transmit data
6	$\overline{CD}$	In	Low	Carrier detect
7	$\overline{RR}$	Out	Low	Ready to receive
8	$\overline{CS}$	In	Low	Clear to send
9	$\overline{RS}$	Out	Low	Request to send

4. Application specification

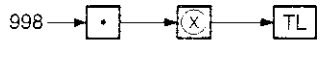
The following service (SRV) modes are available for the serial data transfer of the ER-A570.

1) Data transmit (Source side)



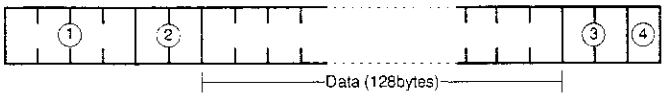
X: 0=SSP DATA
1 = Standard RAM+01RA/02RA
2 = 01MB (0.5MB)/02MB (0.5MB:1st half)
3 = 02MB (0.5MB: 2nd half)

2) Data receive (Target)



5. Data format

A single byte image of the RAM data to be transmitted is divided into a high order 4 bits and low order 4 bits and converted into ASCII code. Then, the image of the memory is sent in the following format:



① Memory top address: 0000H ~ FFFFH
Top address of the memory to be transmitted in ASCII number.

② Page:1D ~ 1F
Page of the memory to be transmitted in ASCII number.

③ Sum check

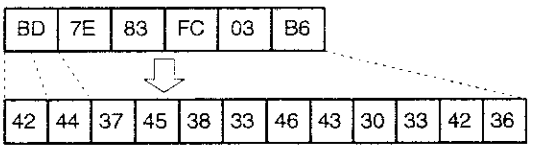
④ End code:
Hex 0D

NOTE:

- In order that contents of RAM memory may not over-ride pages for this job, RAM image is sent in unit of 64 bytes from the address 0000. In other words, 128 bytes are sent at one time on the transmit data format.

RAM DATA FORMAT

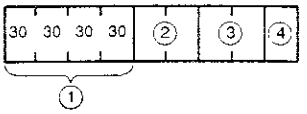
Exhibit:



Code table

HEX	ASCII	Character
0	30	0
1	31	1
2	32	2
3	33	3
4	34	4
5	35	5
6	36	6
7	37	7
8	38	8
9	39	9
A	41	A
B	42	B
C	43	C
D	44	D
E	45	E
F	46	F

6. END record



① End message:
Fixed to 30303030.

② End massage:
Fixed to 4646.

③ Sum check

④ End code:
CR (0D)

7. Operational method

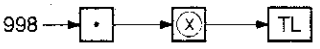
1) To prepare an ER-A570 to receive data from another ER-A570 or the ER-02FD, the memory size of the receiving unit must the same as or greater than the sending unit.

2) Master reset the receiving ER-A570.

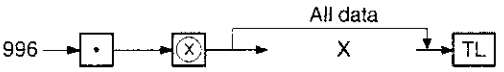
3) Match the baud rate of the transmitter with the receiver using JOB#995 in the SRV mode.

4) Connect loader cable (QCNW-7578RCZZ or ER-A5CB) between ER-A570s.

5) Set the receiving ER-A570 ready to receive.



6) Start the sending ER-A570.



X: 0 = SSP
1 = Standard RAM+01RA/02RA
2 = 01MB (0.5MB)/02MB (0.5MB:1st half)
3 = 02MB (0.5MB: 2nd half)

7) Transmission status.
Description of error status
1: Application error (Command error)
2: Line error (DTR OFF)
3: Application error (Parity error)
4: Application error (Check sum error)
5: Application error (Data size error)
6: Hard ware error
7: Power off error
10: Time out error
11: Application error (Transmit data size error)
12: Application error (Block sequence error)
13: Memory full error

8) Service reset the receiving ER-A570.

8. Saving/Loading of data to/From the FD unit Configuration

1) Turn off the power switch of the ER-02FD, and set the DIP switches of the FD unit as follows:

ER-02FD (The ER-01FD functions of the ER-02FD are used.)

DS-1								DS-2			
1	2	3	4	5	6	7	8	1	2	3	4
OFF	ON	OFF	ON	ON	OFF	OFF	OFF	X	OFF	OFF	OFF

Data rate

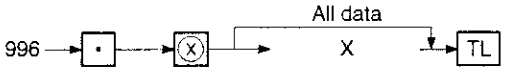
4	6	Rate [bps]
OFF	OFF	19200
ON	OFF	9600
OFF	ON	4800
ON	ON	2400

Disk format
CCP/M: OFF
PC-DOS: ON

2) Connect the QCNW–7578RCZZ cable.

Saving data

1) Turn on the power switch and insert a floppy disk which has been formatted.
2) Start the SEND JOB on the ECR side as follows:

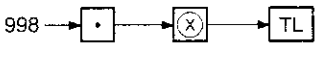


X: 0 = SSP
1 = Standard RAM+01RA/02RA
2 = 01MB (0.5MB)/02MB (0.5MB:1st half)
3 = 02MB (0.5MB: 2nd half)

3) Data transmission is started and the green lamp on the ER-02FD blinks.

Loading data

1) Turn on the power switch and insert the floppy disk which stores the data.
2) Start the RECEIVE JOB on the ECR side as follows:



3) Press the [SEND] key on the FD unit.
4) Data transmission is started and the Green lamp on the ER-02FD blinks.
5) Service reset the ECR.

CHAPTER 7. SERVICE PRECAUTION

1. Hints and tips when installing the RAM chip option (ER-02RA)

1) When the RAM option (ER-02RA) is to be installed to the main PWB, be sure that the ER-02RA is facing in the right direction.

2. Printer motor lock

In the ER-A570, the motor will automatically turn off when a premature halting of the timing signals occurs due to a paper misfeed, ribbon jam, intrusion of alien object, etc. When the motor stops, an intermittent beeping will occur, with no indication in the display.

<How to reset the motor lock>: R/J printer

1) Disconnect the AC cord from the wall outlet. And remove the cause.
2) When power is restored, the following is displayed.

PRINTER ERROR

Fig. 2-1

3) Depress the [CL] key to return the ER-A570 to the point where the cause happened. The power failure symbols will be printed after a line feed.
4) Print sample

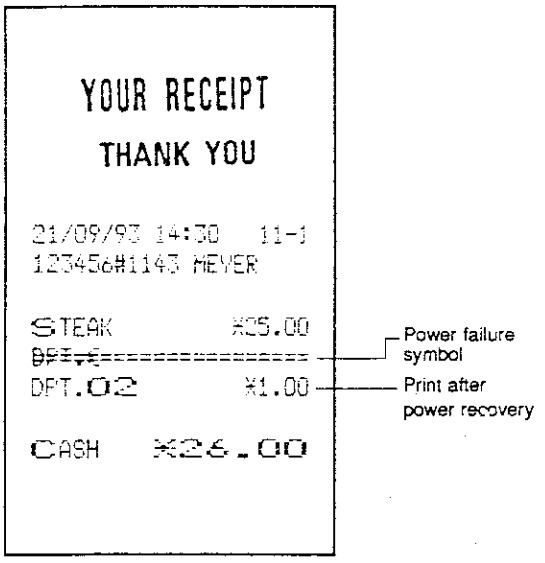


Fig. 2-2

3. Note for upper cabinet installation

When installing the upper cabinet again, be sure to connect the GND wire (QCNW-7120RCZZ) to the proper connector in front of the printer.

4. Others

1) If D1 shorts, the VRAM is shorted with the 5V supply.
In this event, normal operation is usually possible, except that it may not recharge the battery, failing to back it up, resulting in memory frustration.

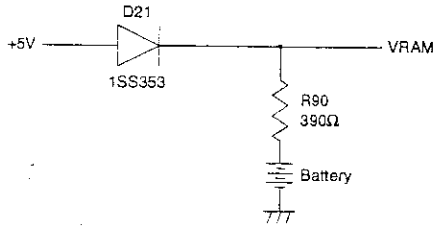


Fig. 4-1

2) When installing the option I/F PWB, be sure to connect it to the left side (under the power PWB) when viewed from the rear of the body. Do not use the right side (under the printer).

3) When removing or installing the option slot rear cover, be sure to lift up the pop-up display. Especially when installing the cover, be sure not to pinch the pop-up display cable between the upper cabinet and the cover.

5. Printer printing speed adjustment

When the printer unit or the power PWB is replaced, the following adjustments should be performed.

1) Tools required for adjustment

① A synchroscope or a universal counter

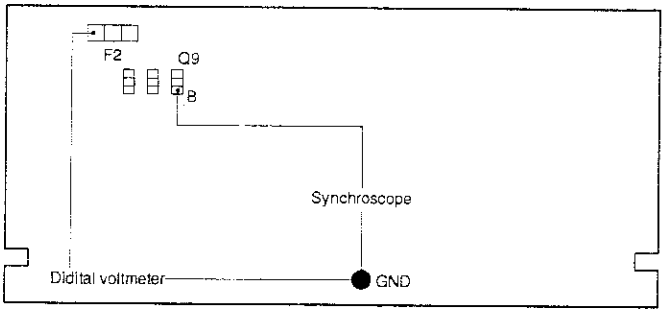
② A digital voltmeter

2) Adjustment procedure

① Remove fuse F2 from the main PWB.

② Connect the probe of the synchroscope or the digital voltmeter with 1 pin and GND of Q9 (KTD1414) on the main PWB.

③ Connect the digital voltmeter pin with fuse F2 and GND of the main PWB.

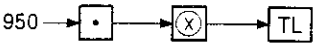


④ Perform the master reset.

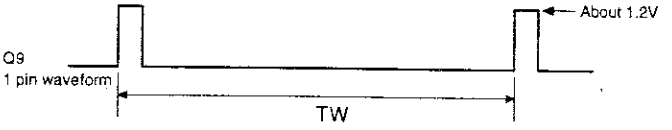
⑤ Turn VR1 on the PS PWB to adjust the voltage to 26.4V (Approx. 2.7 lines/sec).

* Adjust VP so that it is in the range of 24V to 26.4V.

⑥ Perform the printing procedure. (Printing is not performed because the fuse is removed.)



⑦ Measure the time of TW with the waveform of Q9 1 pin as shown in the figure below.



⑧ TW ≧ 357 ms: The adjustment is completed.
TW < 357 ms: Adjust VR1 on the PS PWB so that TW may be 357 ms ±5 ms.

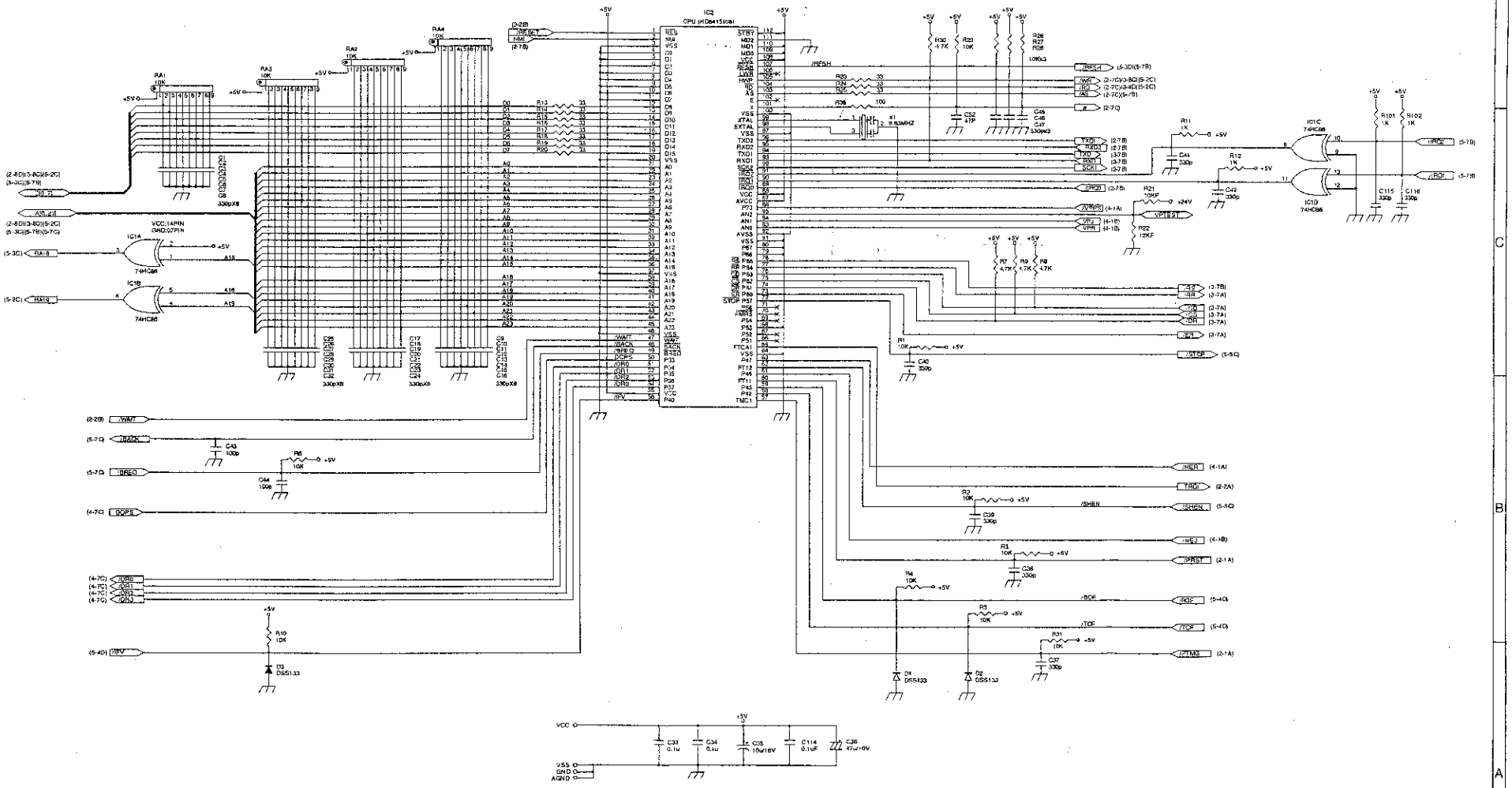
⑨ Turn off the power and disconnect the probe.

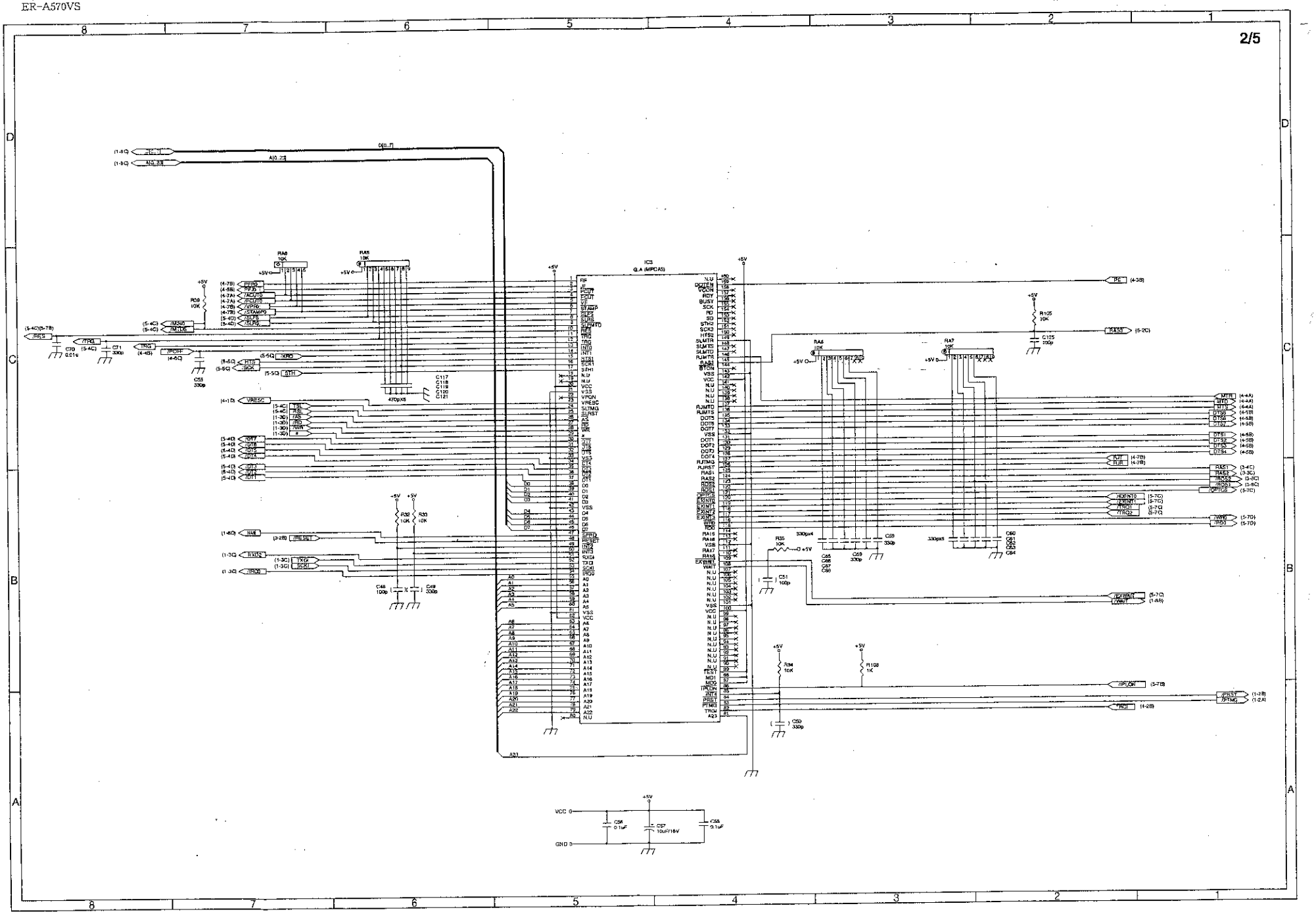
⑩ Attach the fuse to the original position.

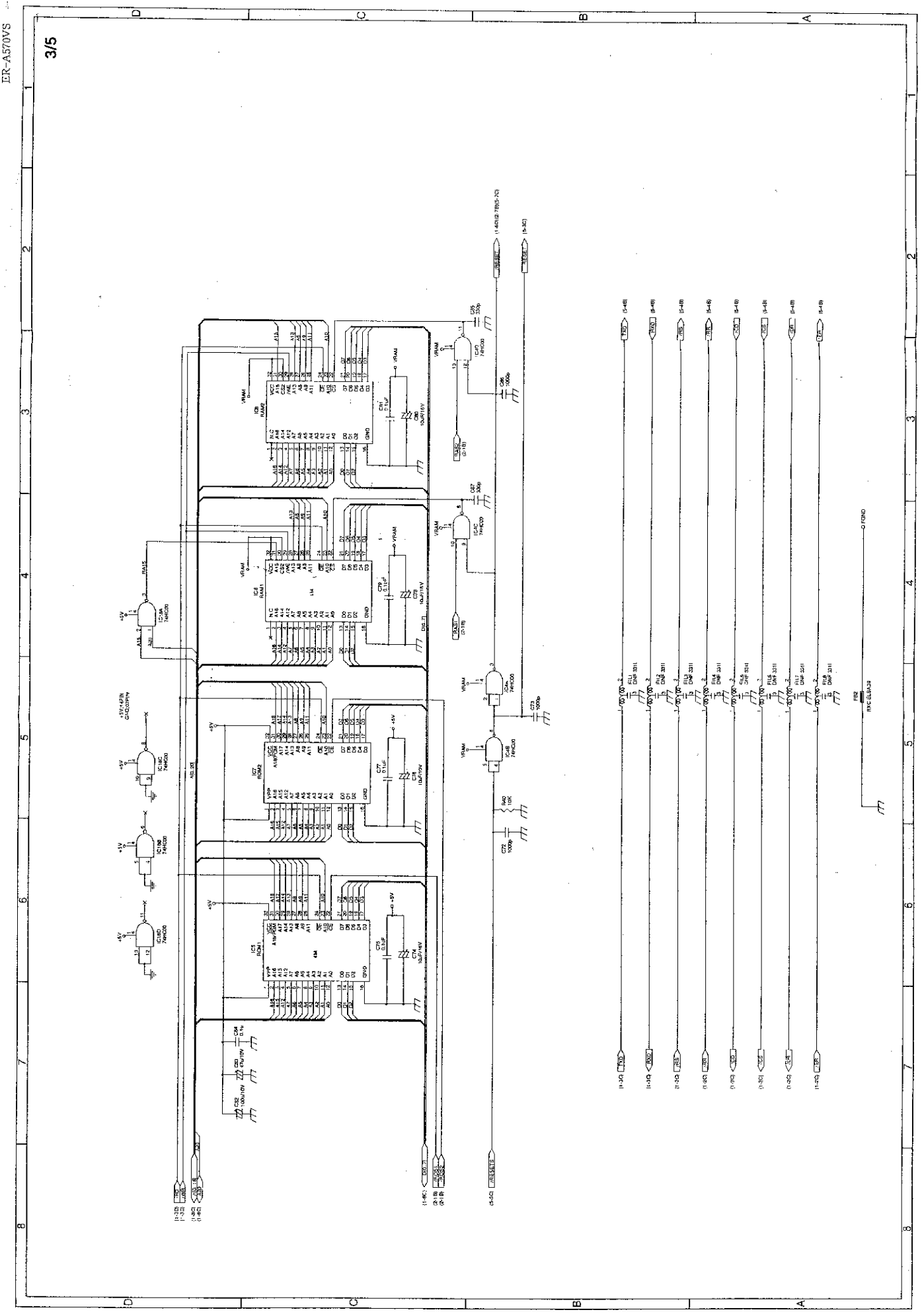
6. For the adjustment of printer dot pulse, refer to CHAPTER 5. TEST FUNCTION, Test No. 150.

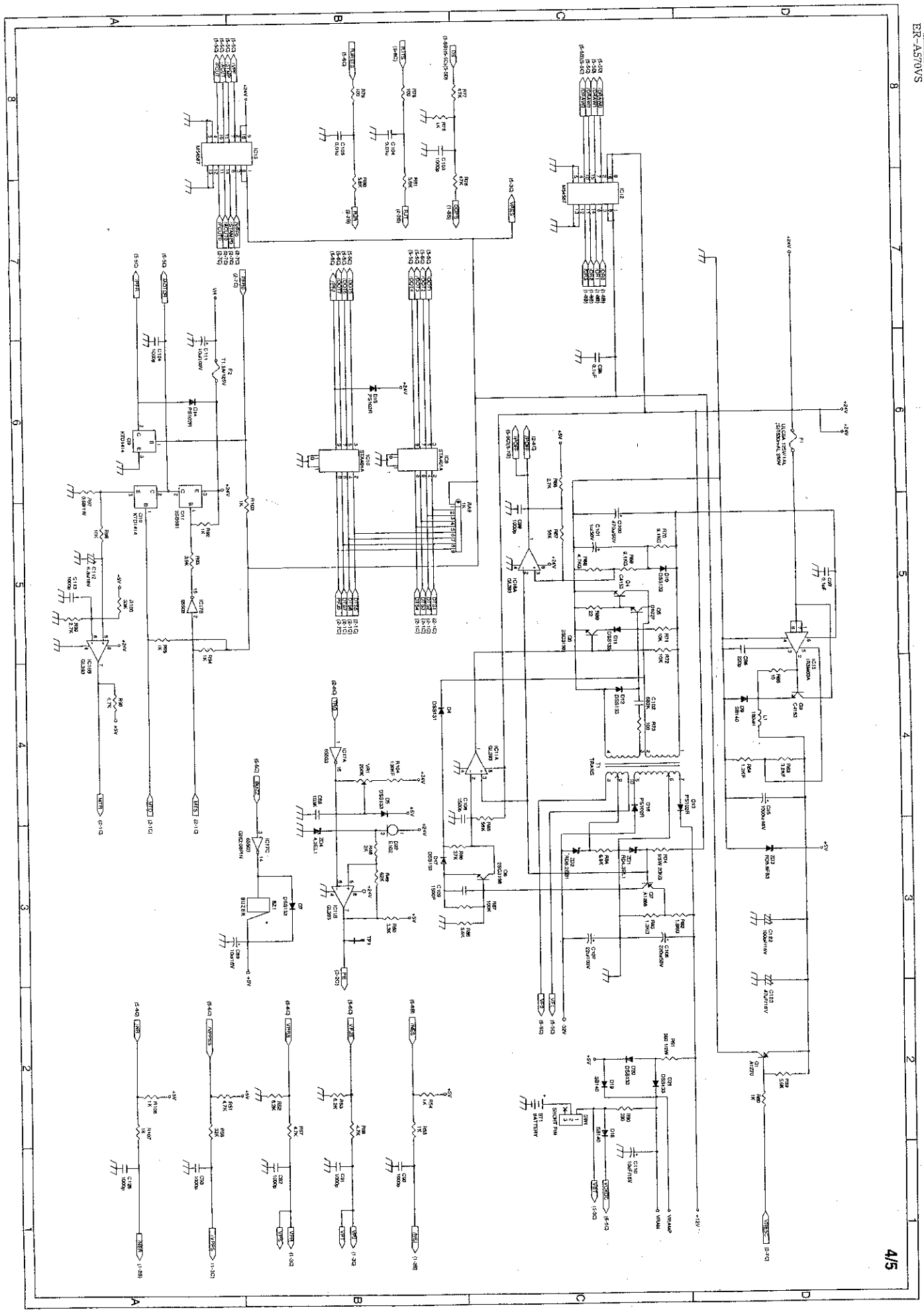
CHAPTER 8. CIRCUIT DIAGRAM & PWB LAYOUT

1. Main PWB circuit diagram

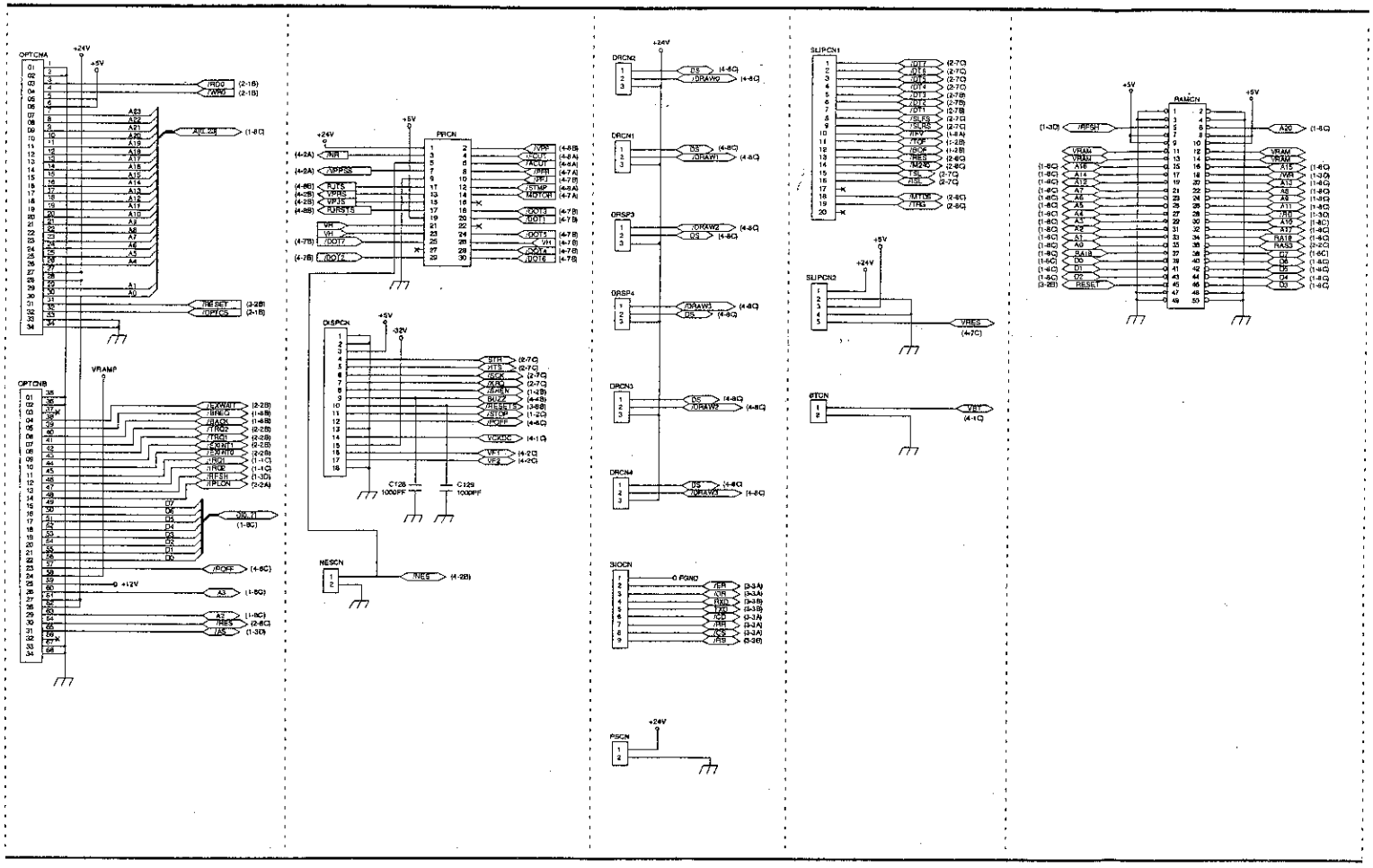



2/5
IC3
G.A (MPCAS)
+5V
C117
C118
C119
C120
C121
470pX5
C70 0.01u
C71 330p
C55 330p
C46 100p
C49 330p
C51 100p
C50 330p
C56 0.1uF
C57 10uF/16V
C58 0.1uF
R30 10K
R32 10K
R33 10K
R35 10K
R105 10K
R108 1K
RA5 10K
RA6 10K
RA7 10K
330pX4
330pX5
VCC
GND

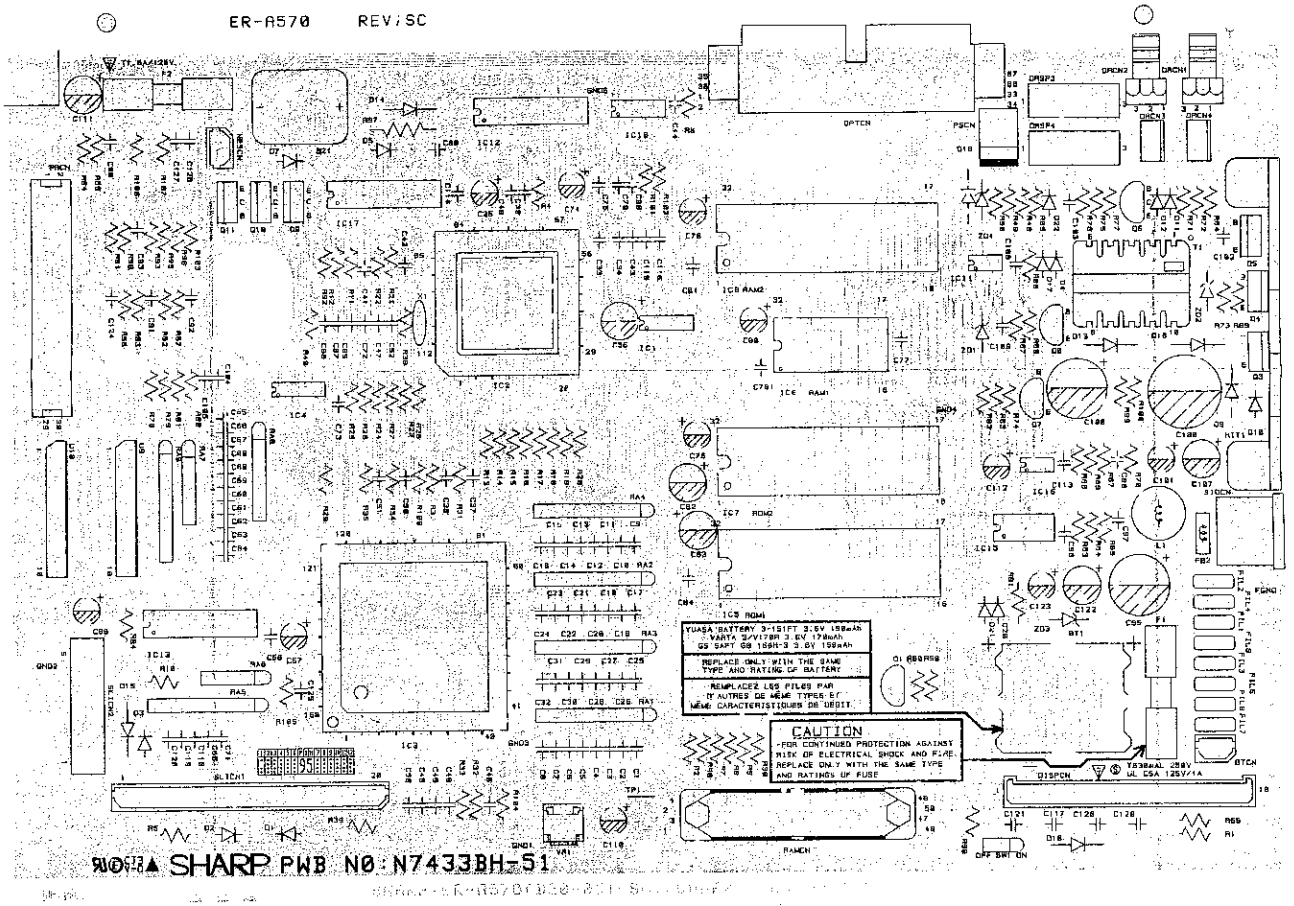

3/5



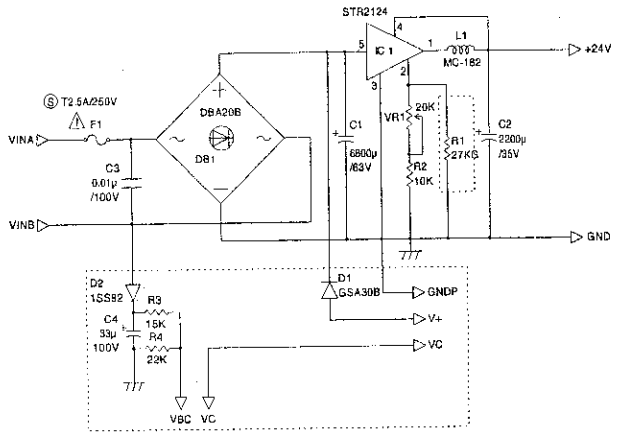
2.MAIN PWB CONECTOR TABLE



2. Main PWB layout


ER-A570 REV:SC
SHARP PWB N0:N7433BH-51
CAUTION
-FOR CONTINUED PROTECTION AGAINST RISK OF ELECTRICAL SHOCK AND FIRE, REPLACE ONLY WITH THE SAME TYPE AND RATINGS OF FUSE

3. Power supply PWB circuit diagram ⚠



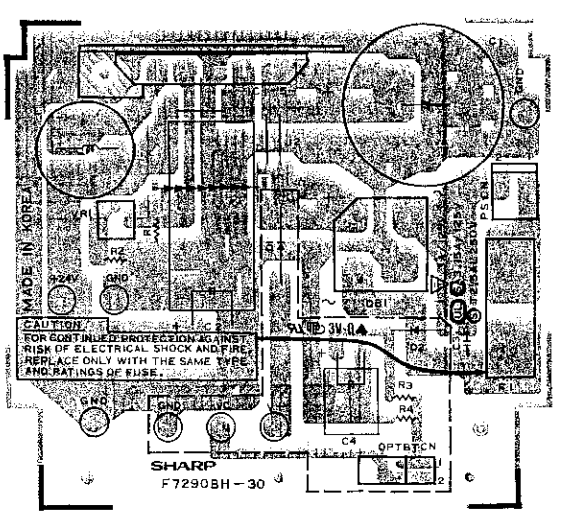
VIN CN

PIN	SIGNAL
1	VINA
2	VINB

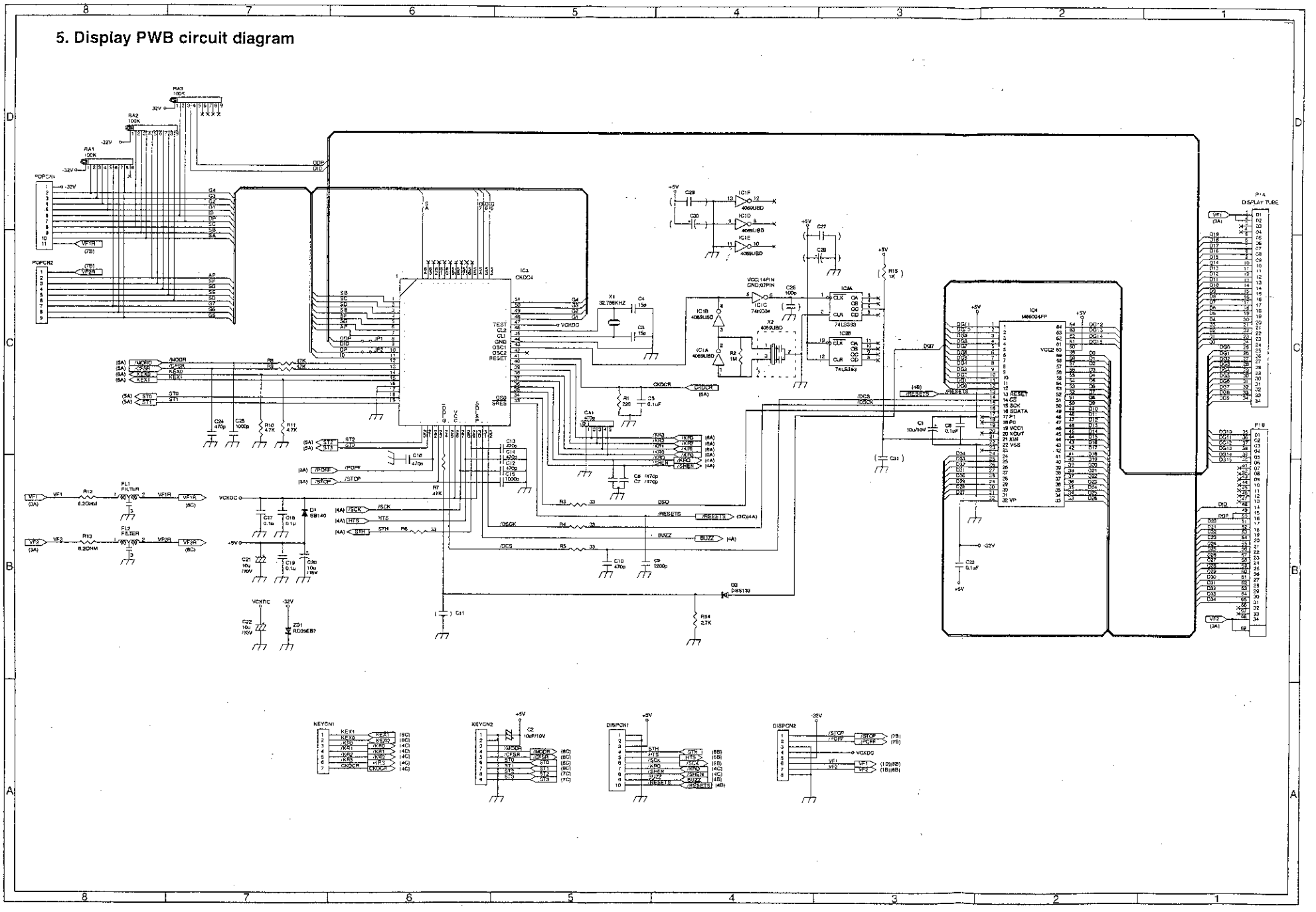
PIN	SIGNAL
1	V+
2	VC
3	GND

PIN	SIGNAL
1	VBC
2	VC

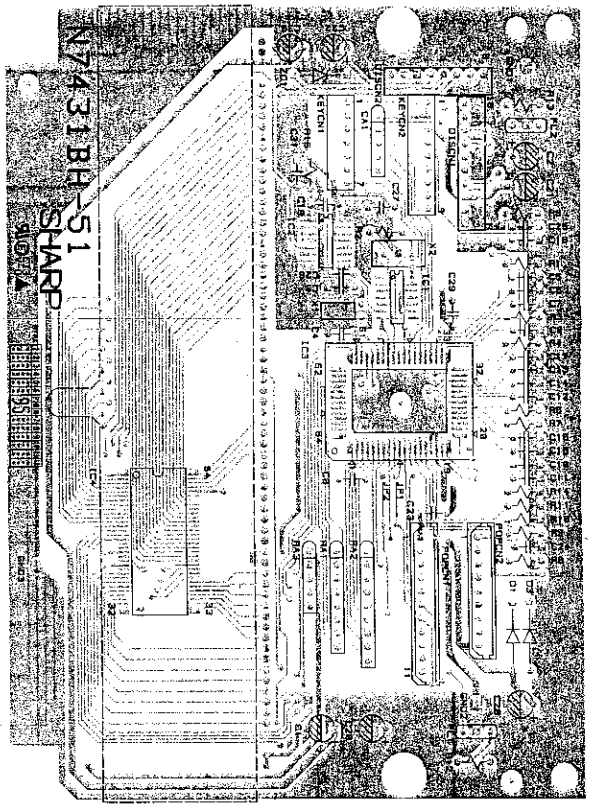
4. Power supply PWB layout



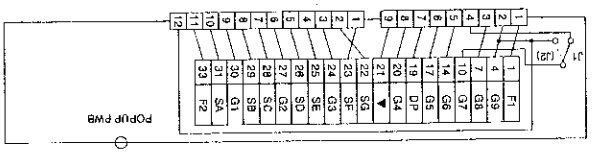
5. Display PWB circuit diagram



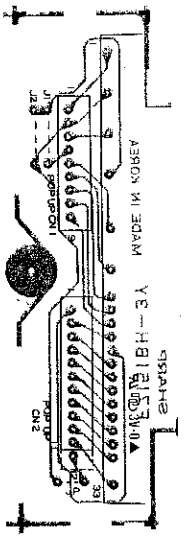
6. Display PWB layout



7. Pop-up display PWB circuit diagram



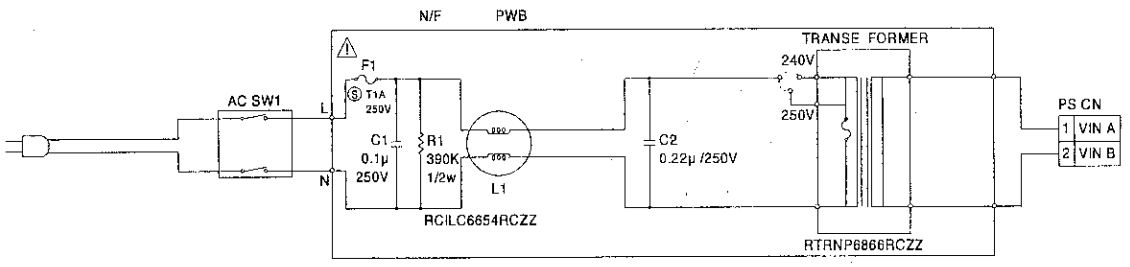
8. Pop-up display PWB layout



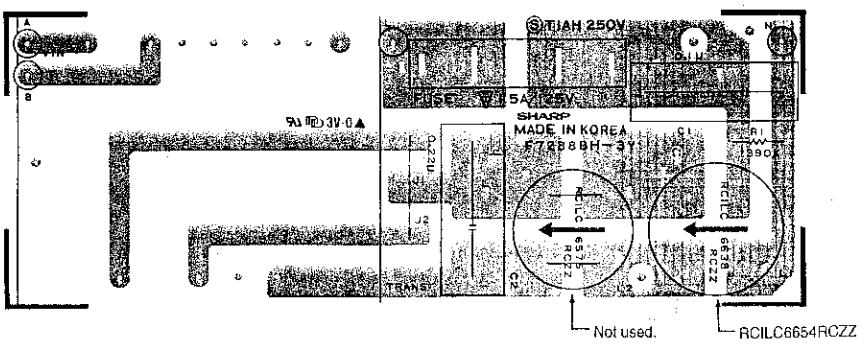
9. Noise filter PWB circuit diagram ⚠

NOISE FILTER PWB TYPE (F7288RC)

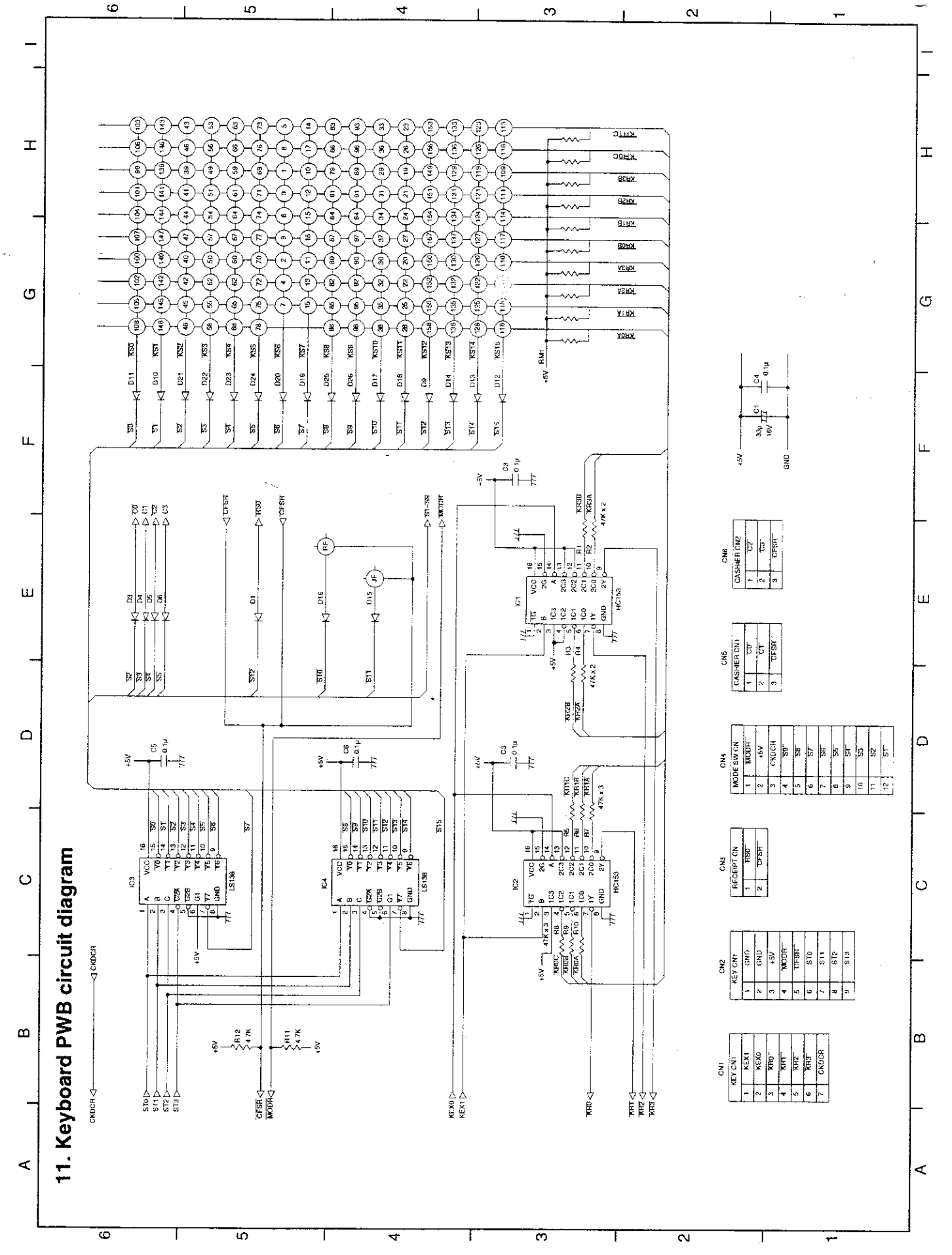
N/F TRANSE PWB UNIT



10. Noise filter PWB layout



11. Keyboard PWB circuit diagram



12. Keyboard position code table

↑ RECEIPT	↑ JOURNAL	28	38	48	58	68	78	88	98	108	118	128	138	148	158
9	18	27	37	47	57	67	77	87	97	107	117	127	137	147	157
8	17	26	36	46	56	66	76	86	96	106	116	126	136	146	156
7	16	25	35	45	55	65	75	85	95	105	115	125	135	145	155
6	15	24	34	44	54	64	74	84	94	104	114	124	134	144	154
5	14	23	33	43	53	63	73	83	93	103	113	123	133	143	153
4	13	22	32	42	52	62	72	82	92	102	112	122	132	142	152
3	12	21	31	41	51	61	71	81	91	101	111	121	131	141	151
2	11	20	30	40	50	60	70	80	90	100	110	120	130	140	150
1	10	19	29	39	49	59	69	79	89	99	109	119	129	139	149

SHARP PARTS GUIDE

MODEL ER-A570

PRINTER: M-820

For TQ, TR, TS, KA, KB

CONTENTS

1 Top cabinet etc.
2 Bottom cabinet etc.
3 Drawer box unit(SK460type)
4 Packing material & Accessories
5 Main PWB unit
6 Display PWB unit
7 Power supply PWB unit
8 Noise filter PWB unit
9 Pop-up PWB unit
10 Articles for consumption
11 Special service tools and service options
12 AC cord
■ Index

Because parts marked with "⚠" is indispensable for the machine safety maintenance and operation, it must be replaced with the parts specific to the product specification.

Table of destinations

SELECTION CODE	COUNTRIES
U	U. S. A., Guam
A	Canada
TS	Germany
TQ	SEEG territory other than Germany (Stamp : English)
TR	SEEG territory other than Germany (Stamp : Spanish)
KB	U. Kingdom
KA	Australia

SELECTION CODE	COUNTRIES
K	Korea

SELECTION CODE	COUNTRIES
RA1	Morocco, Algeria, Tunisia, West Africa
RA2	Chile, Uruguay, Peru, Argentina, Paraguay
RA5	Sri Lanka

SELECTION CODE	COUNTRIES
RB3	Indonesia
RB4	
RB5	Cyprus
RB6	Panama
RB7	Barbados
RB8	Malaysia (U. S. A. version)

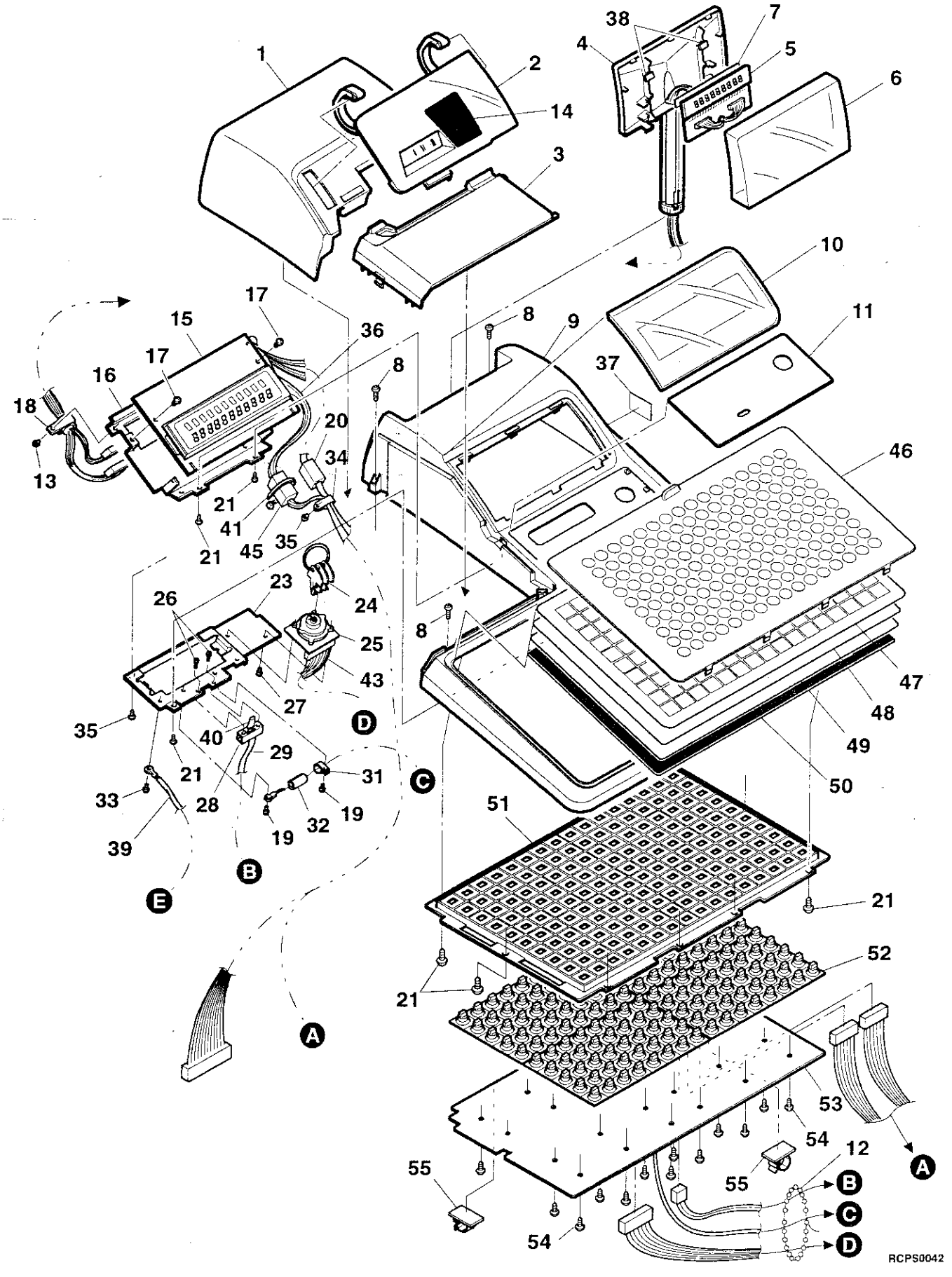
SELECTION CODE	COUNTRIES
SB	Saudi Arabia (127V area)
SBA	Saudi Arabia (220V area)
SC	Taiwan
SD	Venezuela
SE	Hong Kong
SG	Lebanon, Syria, Greece, Pakistan, Iran, Egypt, Thailand, Iraq, Mauritius, Seychelles, Tahiti, Jordan, Sudan, Turkey
SH	South Africa (U. S. A. version)
SHE	South Africa (Europe version)
SJ	Philippines (Europe version)
SJ2	philippines (U. S. A. version)
SM	Kuwait, Qatar, Oman, UAE, Malta,Bahrain
SMT	Nigeria, Yemen, Kenya

SELECTION CODE	COUNTRIES
RC1	Malaysia (Europe version)
RC2	Singapore
RC5	Dominican Republic, Ecuador

1 Top cabinet etc.

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCOVA7038RCZA	AQ		D	Printer cover
2	PFiLW6925RCZZ	AK		D	Journal filter
3	GCOVA7039RCSA	AM		D	Ribbon cover
4	GCAB-7143RCZZ	AH		D	Pop-up cabinet
5	CPWBF7136BH01	BL		E	Pop up PWB unit
6	PFiLW6923BHSH	AR	N	D	Pop up filter
7	PSPAG6729BHZZ	AD	N	C	Display spacer
8	XBBSC30P06000	AA		C	Screw (3×6)
9	GCABB7141RCSA	AY		D	Top cabinet
10	PFiLW6924BHSH	AQ	N	D	Display filter
11	HPNLC6818BHSM	AP	N	D	Deco panel
12	LBNDJ2003SCZZ	AA		C	Band,wire (Large)(80mm)
13	XHBSD30P06000	AA		C	Screw (3×6)
14	PFiLW6926RCZZ	AD		D	Clear filter
15	CPWBN7431BH02	CA	N	E	Display PWB unit (Include No.36)
16	LANGT7505RCZZ	AM		C	Display PWB angle
17	LX-BZ6782BHZZ	AA		C	Screw (3×8KS)
18	RCORF6683RCZZ	AM		C	Core (TFCK16-8-13)
19	XHBSD30P08000	AA		C	Screw (3×8)
20	RCORF1016LCZZ	AL		C	Core (SFC-5)
21	XEBSD30P06000	AA		C	Screw (3×6)
23	LANGT7465RCZZ	AK		C	Switch angle
24	LKGiM7110RCZZ	AG		B	Master key (MA)
	LKGiM7111RCZZ	AG		B	Operator key (OP)
	LKGiM7129RCZZ	AE		B	Sub master key (SM)
25	LKGiW7256RCZZ	AP		B	Mode key switch (Body)
26	XBPSD26P04K00	AA		C	Screw (M2.6×4)(SL-SW)
27	XUPSD23P08000	AA		C	Screw (2.3×8, Mode SW)
28	QSW-S6850BHZZ	AM	N	B	Slide switch
29	QCNW-7434RCZZ	AC		C	Harness (2pin)
31	LHLDW0024SCZZ	AA		C	Wire holder (HP-2N)
32	RCORF6654RCZZ	AH		C	Core (5-28-8-F)
33	XHPSD30P06K00	AA		C	Screw (3×6K)
34	LBNDJ0005FCZZ	AB		C	Clamp (6N)
35	XEBSD30P08000	AA		C	Screw (3×8)
36	QNCW-7615RCZZ	AT		C	Display cable
37	TCAUS6677BHZZ	AD		D	Caution label
38	PHOG-1060CCZZ	AA		C	Display cushion
39	QCNW-7120RCZZ	AE		C	Earth wire (Keyboard↔Printer angle)
40	JKNBZ6882BHZZ	AE		C	SL-SW knob
41	LBNDJ2004BHZZ	AB		C	Nylon band (140mm)
43	QCNW-7722BHZZ	BA	N	C	Mode SW cable
45	RCORF6662RCZZ	AK		C	Core (SFC-6)
46	GCOVB7041RCZZ	AY		D	Flat key cover A
47	PSHEK6822BHZZ	AR	N	D	Key sheet(Standard)
48	PSHEK6823BHZZ	AK	N	D	Key sheet(Programing)
49	PSHEK6777RCZZ	AC		D	Key sheet (Blank)
50	GCOVB7042RCZZ	AW		D	Flat key cover B
51	LFRM-6689BHZZ	AX		C	Housing
52	PGUMM6710BHZZ	AR		C	Rubber sheet
53	CPWBF7385BH01	BT		E	Keyboard PWB ass'y
54	OALZD2006-670	AA		C	Screw (Z-D2006-670)
55	LHLDW6820BHZZ	AE		C	Quick clamp (Large)
501	DUNTK9161BHZZ	BS		E	Keyboard unit (Flat type) (Include No.51~53)

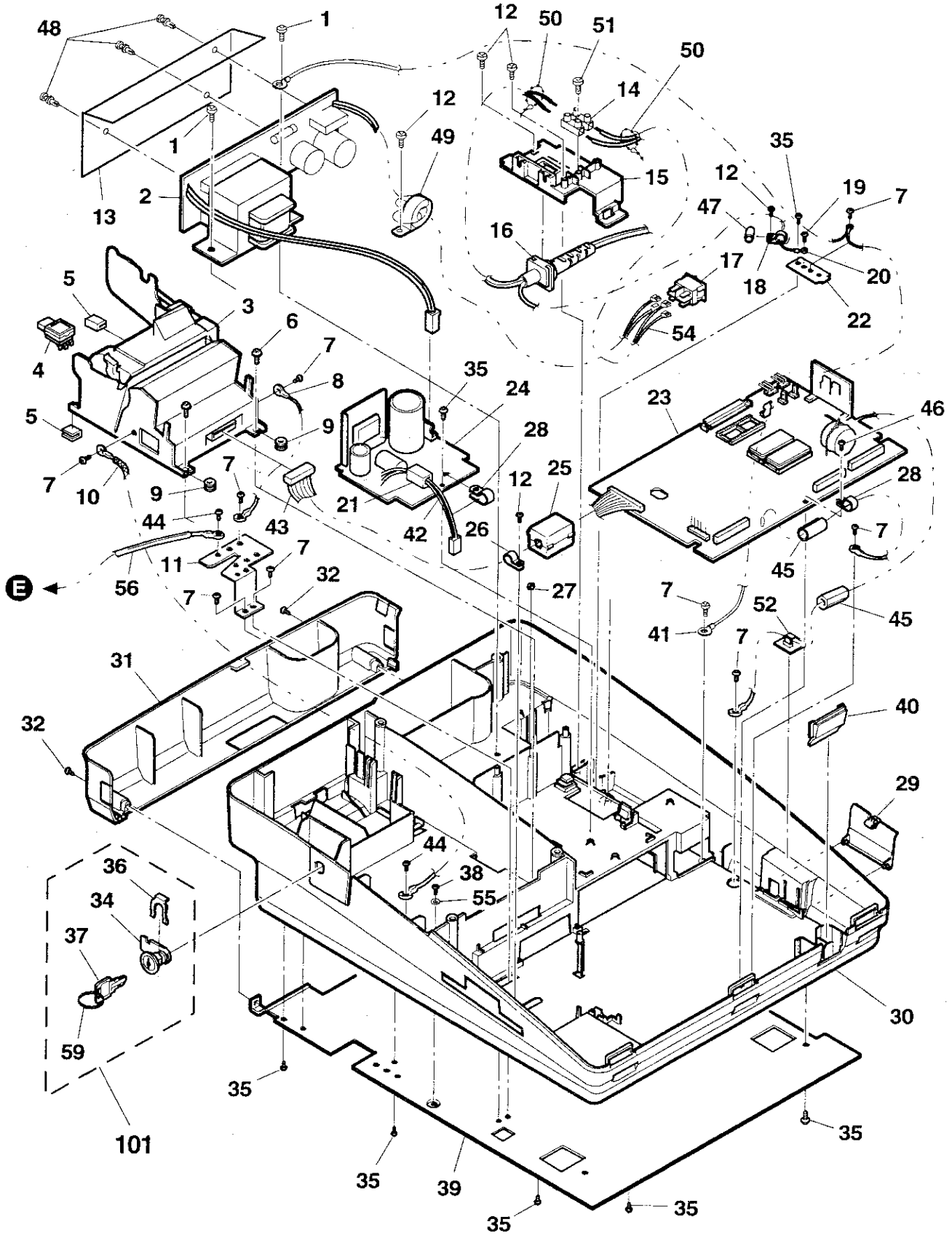
1 Top cabinet etc.



2 Bottom cabinet etc.

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	XUBSD40P08000	AA		C	Screw (4×8)	
⚠2	CPWBF7288BH11	BN	N	E	Noise filter PWB unit	[KA,KB]
⚠2	CPWBF7288BH12	BN	N	E	Noise filter PWB unit	[TQ,TR,TS]
3	Ki-ÖB6754RCZZ	CB		E	Printer (M-820)	
4	PSTM-6782RCZZ	AS		C	Stamp	[TR]
	PSTM-6780RC01	AR		C	Stamp	[KA,KB,TQ]
	PSTM-6785RC01	AS		C	Stamp	[TS]
5	PGUMM6699RCZZ	AB		C	Printer cushion	
6	XJPSD30P12X00	AB		C	Screw (3×12X)	
7	XHPSD30P06K00	AA		C	Screw (M3×6K)	
8	QCNW-7125RCZZ	AD		C	GND wire 3	
9	PCUSG1220BHZZ	AE		C	Printer cushion	
10	QCNW-7122RCZZ	AD		C	GND wire	
11	LANGQ7476RCZA	AF		C	Printer earth angle	
12	XEBSD30P08000	AA		C	Screw (3×8)	
13	PSHEP6789BHZZ	AP		C	N/F protect sheet	
14	QTANN6629RCZZ	AF		C	Block terminal (TYP500)	
15	LHLDK6813RCSA	AE		C	PS holder	
⚠16	QACCE3120QCN5	AL		B	AC cord (250V 2.5A)	[TQ,TR,TS]
⚠16	QACCL7421QCN1	AW		B	AC cord	[KA]
⚠16	QCNW-7212RCZZ	AH		B	BS ordiary cable	[KB]
⚠16	QPLGA0006QCZZ	AQ		C	Plug (3A 250V)	[KB]
17	QSW-C9212QCZZ	AH		B	Seesaw switch	
18	LHLDW0007SCZZ	AA		C	Wire holder (HP-7N)	[KA,KB]
19	XBPBZ40P08K00	AA		C	Screw (M4×8)	[KA,KB]
20	QTANP0004BHZA	AE	N	C	Earth terminal	[KA,KB]
21	RCÖRF6662RCZZ	AK		C	Core (SFC-6)	
22	LANGQ7472RCZA	AE		C	Main GND angle	[KA,KB]
23	CPWBN7433BH01	CK	N	E	Main PWB unit	(Include No.43,45)
⚠24	CPWBF7290BH05	BM		E	Power supply PWB unit	(Include No.42)
25	RCÖRF6666RCZZ	AM		C	Core (SFC-8)	
26	LHLDW0008SCZZ	AA		C	Cable holder (HP-5N)	
27	XNESD30-24000	AA		C	Nut (3mm)	
28	LHLDW0024SCZZ	AA		C	Wire holder (HP-2N)	
29	GFTAS6769RCSA	AC		D	SIO connecter lid	
30	GCABA7142RCAB	BD		D	Bottom cabinet	
31	GCÖVA7040RCSA	AQ		D	Rear cover	
32	XBBSC30P20000	AA		C	Screw (3×20)	
34	LKGiW7355BHZA	AV		B	Lock key (Body)	
35	XEBSD30P06000	AA		C	Screw (3×6)	
36	MSPRK6730BHZZ	AC		C	Lock spring	
37	LKGiM7356BHZZ	AK		B	Printer cover lock key	
38	XHPSD40P08KS0	AA		C	Screw (4×8KS)	
39	LCHSM6692RCZA	AW		C	Main chassis	
40	GFTAF6770RCSA	AC		D	Clerk key lid	
41	QCNW-7590RCZZ	AC		C	GND wire	[TQ,TS,TR]
	QCNW-7592RCZZ	AD		C	GND wire	[KA,KB]
42	QCNW-7575RCZZ	AE		C	PS cable (2pin)	
43	QCNW-7518RCZZ	AR		C	Printer cable	
44	XBPSD30P06KS0	AA		C	Screw (M3×6KS)	
45	RCÖRF6661RCZZ	AK		C	Core (SFC-4)	
46	XJBSD30P10000	AA		C	Screw (M3×10)	
47	RCÖRF6650RCZZ	AE		C	Core (TR12.5-8-12)	[KA,KB]
48	LX-LZ5001CHZZ	AC		C	Bushing	
49	RCÖRF7001SCZZ	AL		C	Core (ESD-R-25DR)	
50	LBNDJ2003SCZZ	AA		C	Band,wire (Large)(80mm)	
51	XUPSD30P16000	AA		C	Screw (M3×16)	
52	LHLDW6821BHZZ	AD		C	Clamp	
54	QCNW-7591RCZZ	AE		C	Shield cable	
55	XWSSD50-13000	AA		C	Washer (5mm)	
56	QCNW-7120RCZZ	AE		C	Earth wire (Keyboard↔Printer angle)	
59	PRNGT6639BHZZ	AB		C	Key ring	
101	DUNT-1817BH01	AW		E	Lock key unit (Printer)	(Include No.34,36,37,59)

2 Bottom cabinet etc.

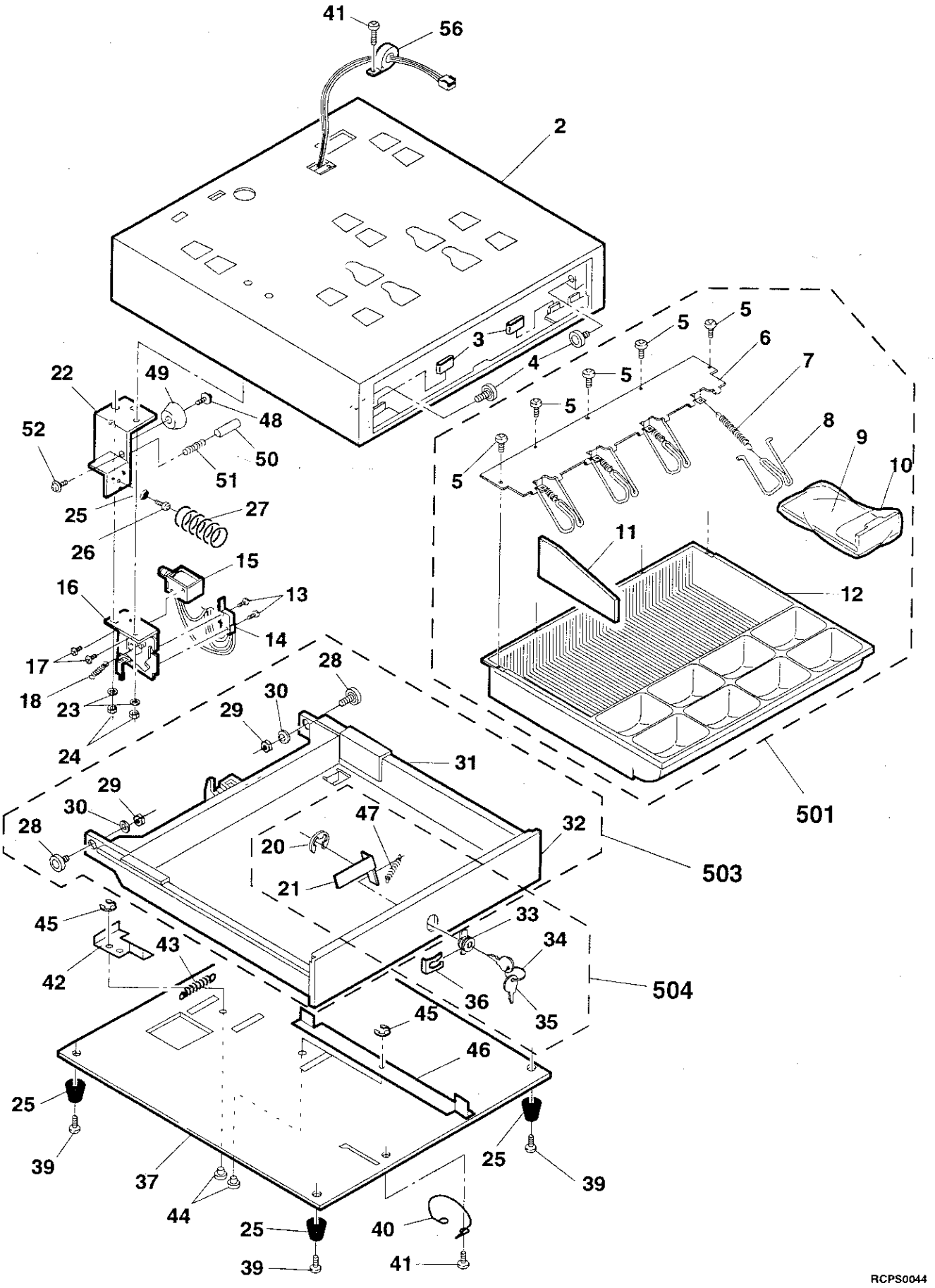


RCPS0043

3 Drawer box unit(SK460 type)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
2	CCABM7171BHZZ	BQ		D	Cabinet unit
3	PGUMM6695BHZZ	AE		D	Stopper gum
4	NRÖLP6650BHZZ	AP		C	Roller
5	XUPSD30P08000	AA		C	Screw (3×8)
6	LBRC-6663BHZZ	AQ		C	Bill bracket
7	MSPRT6714BHZZ	AE		C	Bill spring
8	MLEVF6695BHZZ	AK		C	Bill lever
9	PSKR-6629BHZZ	AL		C	Bill separator
10	SSAKA5004BHZZ	AA		D	Vinyl bag
11	PSKR-6628BHZZ	AG		C	Separator
12	GCAS-6680BHZZ	BB		D	Money case
13	LX-BZ6776BHZZ	AA		C	Screw
14	QSW-M6872BHZZ	AR		B	Micro switch
15	CPLU-6641BH01	BC		B	Plunger
16	CFRM-6683BH01	AW		C	Lock frame unit
17	LX-BZ6775BHZZ	AA		C	Screw
18	MSPRT6713BHZZ	AD		C	Open lever spring
20	XRESJ50-06000	AA		C	E type ring (5mm)
21	MCAMM6634BHZZ	AE		C	Lock cam
22	LFRM-6682BHZZ	AN		C	Bell frame
23	XWSSD40-10000	AA		C	Washer (4mm)
24	XNESD40-32000	AA		C	Nut (M4)
25	PGUMM6696BHZZ	AE		D	Gum leg
26	XHBSD30P12000	AA		C	Screw (3×12)
27	MSPRC6723BHZZ	AE		C	Push out spring
28	NRÖLP6650BHZZ	AP		C	Roller
29	XNESD60-50000	AA		C	Nut (M6)
30	XWSSD60-15000	AA		C	Washer (6mm)
31	CCAS-6679BH01	BE		D	Case unit
32	GCÖVA7053BHZZ	AR		D	Front cover
33	LKGiW7330BHZZ	AY		B	Lock key (Body)
34	PRNGT6637BHZZ	AA		C	Key ring
35	LKGiM7331BHZZ	AE		B	Lock key (1pc)
36	MSPRK6718BHZZ	AF		C	Lock key spring
37	CPLTM6680BHZB	BM		D	Bottom plate unit ass'y (Include №42~46)
39	XHBSD40P15000	AA		C	Screw (4×15)
40	MSPRB6722BHZZ	AC		C	Earth spring
41	XHPSC30P08000	AA		C	Screw (3×8)
42	MLEVF6698BHZZ	AH		C	Manual lever "B"
43	MSPRB6724BHZZ	AC		C	Open spring
44	LPiNS6641BHZZ	AD		C	Manual pin
45	XRESJ40-06000	AA		C	E type ring (4mm)
46	MLEVF6697BHZZ	AN		C	Manual lever "A"
47	MSPRT6725BHZZ	AC		C	Key spring
48	XBPSD40P06K00	AA		C	Screw (4×6K)
49	RALML6647BHZZ	AR		B	Bell
50	NSFTM6650BHZZ	AD		C	Bell hammer
51	MSPRC6715BHZZ	AE		C	Bell spring
52	XBPSD40P06000	AA		C	Screw (4×6)
56	LHLDW4081CCZZ	AC		C	Cable holder
501	CCAS-6680BH01	BG		E	Money case unit (4B/8C)
503	GDRW-6679BH01	BG		D	Drawer case unit (Include №28~32)
504	DUNT-1307BHZZ	AY		E	Lock key unit (Include №20,21,33~36)
	(Unit)				
901	GBÖXD7122BHZZ	BY		E	Drawer box unit

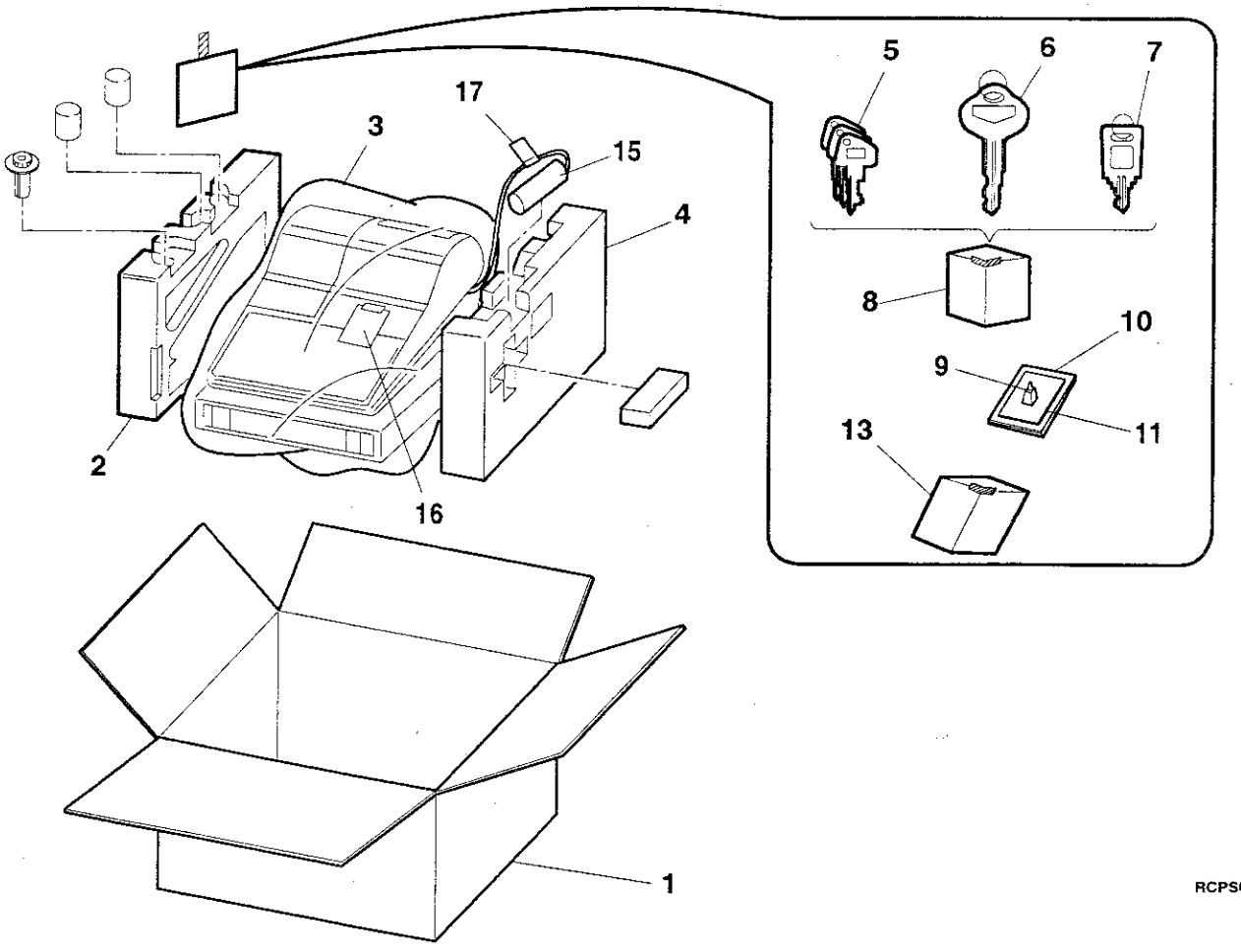
3 Drawer box unit(SK460 type)



RCPS0044

4 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	SPAKC7996BHSF	AZ	N	D	Packing case
2	SPAKA7985RCZZ	AQ		D	Packing cushion (Right)
3	PSHEP6812BHZZ	AF		D	Packing sheet (1200×1200)
4	SPAKA7986RCZZ	AR		D	Packing cushion (Left)
5	LKGiM7110RCZZ	AG		B	Master key (MA)
	LKGiM7111RCZZ	AG		B	Operator key (OP)
	LKGiM7129RCZZ	AE		B	Sub master key (SM)
6	LKGiM7331BHZZ	AE		B	Lock key (1pc)
7	LKGiM7356BHZZ	AK		B	Printer cover lock key
8	SSAKH3012CCZZ	AA		D	Vinyl bag (80×120mm)
9	UiNK-1001CCZZ	AK		S	Ink (5cc)(Purple)
10	TiNSE7313BHZZ	AX	N	D	Instruction book
	TiNSF7314BHZZ	AX	N	D	Instruction book [TQ,TR,TS]
	TiNSG7315BHZZ	AX	N	D	Instruction book [TQ,TR,TS]
	TiNSS7316BHZZ	AX	N	D	Instruction book [TQ,TR,TS]
11	TGANE1001BHZA	AF		D	Guaranty [KA]
	TCADZ2001BHZA	AM		D	Install card [KA]
13	SSAKH3015CCZZ	AA		D	Vinyl bag (200×300mm)
15	SSAKH4231CCZZ	AA		D	Vinyl sack (140×500)
16	TCADH6788BHZZ	AC		D	Caution card
17	TCAUS0002BHZZ	AD		D	Caution label [KB]
101	UBNDA1008CCZZ	AA		C	AC-code band (120mm, GREEN)



RCPS0045

5 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	VHiF258016PC/	AZ		B	IC (F258016PC)	[IC3]
2	VHiH641510810	BA		B	IC (H641510810)	[IC2]
3	VHiHM128F12SL	BN		B	IC (HM128F12SL)	[IC6]
4	VHiSN74HC00NS	AC		B	IC (SN74HC00NS)	[IC4,18]
5	VHiiR9393N/-1	AD		B	IC (IR9393N)	[IC11,16]
6	VHiGD74HC86DS	AH	N	B	IC (GD74HC86)	[IC1]
7	VHDDSS131HV-1	AA		B	Diode (DSS131HV)	[D4]
8	VHDEK04////-1	AD		B	Diode (EK04)	[D9,18,19]
9	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D1,2,3,5,7,10,11,12,17,20,21]
10	VHDPS102R//-1	AD	N	B	Diode (PS102R)	[D13,14,15,16]
11	VHEMTZ9.1C/-1	AA		B	Zener diode (MTZ9.1C)	[ZD2]
12	VRD-RB2HY561J	AA		C	Resistor (1/2W 560Ω ±5%)	[R91]
13	VRD-RC2EY100J	AA		C	Resistor (1/4W 10Ω ±5%)	[R65]
14	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R36,73,78,79]
15	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R11,12,54,55,60,75,92,94,95,101,102,103]
	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R106,107,108]
16	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R1~6,10,26~29,31,32,33,34,35,39,40,71,72]
	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R98,105]
17	VRD-RC2EY104J	AA		C	Resistor (1/4W 100KΩ ±5%)	[R87]
18	VRD-RC2EY132G	AA		C	Resistor (1/4W 1.3KΩ ±2%)	[R83]
19	VRD-RC2EY182G	AA		C	Resistor (1/4W 1.8KΩ ±2%)	[R82]
20	VRD-RC2EY202J	AA		C	Resistor (1/4W 2.0KΩ ±5%)	[R48]
21	VRD-RC2EY203G	AA		C	Resistor (1/4W 20KΩ ±2%)	[R74]
22	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R89]
23	VRD-RC2EY272J	AA		C	Resistor (1/4W 2.7KΩ ±5%)	[R66,99]
24	VRD-RC2EY273J	AA		C	Resistor (1/4W 27KΩ ±5%)	[R86]
25	VRD-RC2EY330J	AA		C	Resistor (1/4W 33Ω ±5%)	[R13~20,23,24,25]
26	VRD-RC2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)	[R50]
27	VRD-RC2EY333J	AA		C	Resistor (1/4W 33KΩ ±5%)	[R58,100]
28	VRD-RC2EY391J	AA		C	Resistor (1/4W 390Ω ±5%)	[R90]
29	VRD-RC2EY392J	AA		C	Resistor (1/4W 3.9KΩ ±5%)	[R93]
30	VRD-RC2EY472G	AA		C	Resistor (1/4W 4.7KΩ ±1%)	[R68]
31	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R7,8,9,30,51,56,57,77,96]
32	VRD-RC2EY473J	AA		C	Resistor (1/4W 47KΩ ±5%)	[R76]
33	VRD-RC2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)	[R59,80,81,88]
34	VRD-RC2EY563J	AA		C	Resistor (1/4W 56KΩ ±5%)	[R67,85]
35	VRD-RC2EY622J	AA		C	Resistor (1/4W 6.2KΩ ±5%)	[R52,53]
36	VRD-RC2EY623J	AA		C	Resistor (1/4W 62KΩ ±5%)	[R49]
37	VRD-RC2EY682J	AA		C	Resistor (1/4W 6.8KΩ ±5%)	[R84]
38	VRD-RC2EY912G	AA		C	Resistor (1/4W 9.1KΩ ±2%)	[R69,70]
39	VRNRC2EK1002F	AA		C	Resistor (1/4W 10KΩ ±1%)	[R21]
40	VRNRC2EK1201F	AA		C	Resistor (1/4W 1.2KΩ ±1%)	[R22,64]
41	VRNRC2EK1303F	AA		C	Resistor (1/4W 130KΩ ±1%)	[R104]
42	VRNRC2EK3601F	AA		C	Resistor (1/4W 3.6KΩ ±5%)	[R63]
43	VHEE102////-1	AC		B	Zener diode (E102)	[D22]
44	VHERD4.3EL1-1	AA		B	Zener diode (RD4.3EL1)	[ZD1,4]
45	VHERD5.6FB3-1	AC		B	Zener diode (RD5.6FB3)	[ZD3]
46	UBATN6639BHZZ	BC		B	Battery (170MA 2.4V)	[BT1]
47	RCORF6661RCZZ	AK		C	Core (SFC-4)	[GND1,FGND]
48	RCORF6666RCZZ	AM		C	Core (SFC-8)	
49	QFSHD2109AFZZ	AC		C	Fuse holder (HD2109AF)	[F1,2]
50	RC-KZ1054CCZZ	AB		C	Capacitor (50WV 0.1μF)	[C33,34,56,58,75,77,79,81,84,97,98,114]
51	VCEAGU1CW106M	AA		C	Capacitor (16WV 10μF)	[C35,57,74,89,110]
52	VCEAGU1HW105M	AA		C	Capacitor (50WV 1μF)	[C101]
53	VCEAGU2AW106M	AB		C	Capacitor (100WV 10μF)	[C111]
54	VCEAGU2AW226M	AB		C	Capacitor (100WV 22μF)	[C107]
55	VCKYPU1HB101K	AA		C	Capacitor (50WV 100PF)	[C43,44,125]
56	VCKYPU1HB102K	AA		C	Capacitor (50WV 0.0010μF)	[C72,73,86,90~93,99,103,113,124,126,128,129]
57	VCKYPU1HB152K	AA		C	Capacitor (50WV 1500PF)	[C108,109]
58	VCKYPU1HB221K	AB		C	Capacitor (50WV 220PF)	[C96]
59	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C1~32,37~42,45,46,47,55,59~69,71,85,87,115]
	VCKYPU1HB331K	AA		C	Capacitor (50WV 330PF)	[C116]
60	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C117~121]
61	VCCSPU1HL470J	AA		C	Capacitor (50WV 47pF)	[C52]
62	VCQYNU1HM103K	AA		C	Capacitor (50WV 0.010μF)	[C70,88,104,105]
63	VCQYNU1HM683K	AB		C	Capacitor (50WV 0.068μF)	[C102]
64	VS2SA1266-/-1	AC		B	Transistor (2SA1266)	[Q7]
65	VS2SA673-//-1	AD		B	Transistor (2SA673)	[Q1]
66	VS2SD667-//-1	AD		B	Transistor (2SD667)	[Q5]
67	VS2SC3198-/-1	AL		B	Transistor (2SC3198)	[Q6,8]
68	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C76,78,80]
69	RC-EZ107BRC1A	AH		C	Capacitor (10WV 100μF)	[C122]
70	RC-EZ476ARC1A	AF		C	Capacitor (10WV 47μF)	[C36,83]
71	RC-EZ685ARC1C	AD		C	Capacitor (16WV 6.8μF)	[C112]
72	RFiLN6014RCZZ	AC		C	Filter (DNF331I)	[FIL1~8]
73	XHBSD30P06000	AA		C	Screw (3×6)	[Heat sink]
74	PRDAF6650RCZB	AG		C	Heat sink	
75	QCNCM1101BHZZ	AC		C	PS connector (2pin)	[PSCN]
76	QCNCM2379RC0E	AC		C	Connector (5pin)	[SLIPCN2]
77	QCNCM5278NCZZ	AC		B	Connector (3pin)	[DRCN1,2]

5 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
78	QCNCM6865RC2J	AD		C	Connector (20pin)	[SLIPCN1]
79	QCNCM6926RC1H	AE		C	Connector (18pin)	[DISPCN]
80	QCNCM7073RC6H	AM		C	Connector (68pin)	[OPTCN]
81	QCNCW1057ACZZ	AB		C	Connector (Short socket)	[SW1]
82	QCNCW1084ACZZ	AG		C	Connector (9pin)	[SIOCN]
83	QCNW-7124RCZZ	AB		C	GND wire 2 (To switch angle)	[GND1,FGND]
84	QCNW-7518RCZZ	AR		C	Printer cable	[PRCN]
85	QCNCW7086RC5J	AK		C	Connector (50pin)	[RAMCN]
86	QCNCM1060AC03	AB		C	Connector (3pin)	[SW1]
⚠ 87	QFS-A1037CCZZ	AC		A	Fuse (1.5A)(MINI TYPE)	[F2]
⚠ 88	QFS-C4081CCZZ	AF		A	Fuse (250V 2.5A)	[F1]
89	QSOCZ2042SC32	AE		C	IC socket (32pin)	[IC5,7,8]
90	RALMB6640RCZZ	AF		B	Buzzer (SMX06)	[BZ1]
91	RCiLC6647BHZZ	AK	N	C	Coil	[L1]
92	RCORF6674RCZZ	AB		C	Beads core (SA39)	[FB2]
93	RCRSP6661RCZZ	AD		B	Crystal (9.830MHz)	[X1]
94	RMPTC4103QCKB	AC		B	Block resistor (10KΩ×4 1/8W ±10%)	[RA6]
95	RMPTC5103QCKB	AC		B	Block resistor (10KΩ×5 1/8W ±10%)	[RA7]
96	RMPTC6103QCKB	AC		B	Block resistor (10KΩ×6 1/8W ±10%)	[RA8]
97	RMPTC8102QCKB	AD		B	Block resistor (1.0KΩ×8 1/8W ±10%)	[RA9]
98	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA1,2,3,4,5]
⚠ 99	RTRNH6783RCZZ	AN		B	Converter transformer	[T1]
100	RVR-M2517QCZZ	AE		B	Variable resistor (200KΩ)	[VR1]
101	VCEAGU1CW108M	AD		C	Capacitor (16WV 1000μF)	[C95]
102	VCEAGU1HW227M	AC		C	Capacitor (50WV 220μF)	[C106]
103	VCEAGU1HW477M	AD		C	Capacitor (50WV 470μF)	[C100]
104	VHiC7040RAJ1A	BR	N	B	IC (27040RAJ1A)	[IC5]
105	VHiiR3M03AV-1	AH		B	IC (IR3M03AV)	[IC15]
106	VHiKiD65503-1	AK		B	IC (KID65503)	[IC17]
107	VHiM54567P/-1	AK		B	IC (M54567P)	[IC12,13]
108	VHiSTA401A/-1	AP		B	IC (STA401A)	[U9,10]
109	VS2SB881-//-1	AH		B	Transistor (2SB881)	[Q11]
110	VSKTD1414//-1	AL	N	B	Transistor (KTD1414)	[Q9,10]
111	VRS-RE3AAR68J	AA		C	Resistor (1W 0.68Ω ±5%)	[R97]
112	VS2SC4153-/-1	AG		B	Transistor (2SC4153)	[Q3,4]
113	XBSSD30P08000	AA		C	Screw (3×8)	[TR]
114	XNESD30-24000	AA		C	Nut (3mm)	[TR]
	(Unit)					
901	CPWBN7433BH01	CK	N	E	Main PWB unit	

6 Display PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	VHiH4728A75FS	AX		B	IC (CKDC4)	[IC3]
2	VHiM66004FP-1	AY		B	IC (M66004FP)	[IC4]
3	VHiGD4069D/-1	AG		B	IC (GD4069UBD)	[IC1]
4	VHiGD74LS393D	AL	N	B	IC (74LS393D)	[IC2]
5	VRD-HT2EY8R2J	AA		C	Resistor (1/4W 8.2Ω ±5%)	[R12,13]
6	VRD-RC2EY105J	AA		C	Resistor (1/4W 1.0MΩ ±5%)	[R2]
7	VRD-RC2EY272J	AA		C	Resistor (1/4W 2.7KΩ ±5%)	[R14]
8	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R1]
9	VRD-RC2EY330J	AA		C	Resistor (1/4W 33Ω ±5%)	[R3,4,5,6]
10	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R10,11]
11	VRD-RC2EY473J	AA		C	Resistor (1/4W 47KΩ ±5%)	[R7,8,9]
12	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D3]
13	VHDEK04////-1	AD		B	Diode (EK04)	[D1]
14	VHERD39EB7/-1	AB		B	Zener diode (RD39EB7)	[ZD1]
15	RC-KZ1054CCZZ	AB		C	Capacitor (50WV 0.1μF)	[C8,18,19,23]
16	RC-EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C1,2,21,22]
17	VCCCPU1HH150J	AA		C	Capacitor (50WV 15PF)	[C3,4]
18	VCEAEU1CW106M	AA		C	Capacitor (16WV 10μF)	[C20]
19	VCKYPU1HB102K	AA		C	Capacitor (50WV 0.0010μF)	[C15,25]
20	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C6,7,10,12,13,14,16,24]
21	RC-Z1N104RCZU	AD		C	Capacitor (16WV 0.10μF)	[C5,17]
22	VCTYPU1EX223M	AB		C	Capacitor (25WV 0.022μF)	[C9]
23	QCNCM6865RC0i	AC		C	Connector (9pin)	[POP CN2]
24	QCNCM6865RC1A	AD		C	Connector (11pin)	[POP CN1]
25	QCNW-7599RCZA	AQ	N	C	Lead wire	[KEYCN2]
26	QCNW-7615RCZZ	AT		C	Display cable	[DISPCN1,2]
27	QCNW-7616RCZZ	AK		C	Key-display cable (7pin)	[KEYCN1]
28	RFiLN6012RCZZ	AB		C	EMI filter (1000pF)	[FL1,2]
29	RCRSP6658RCZZ	AE		B	Crystal (32.768KHz)	[X1]
30	RCRSZ6644RCZZ	AD		B	Crystal (4.19MHz)	[X2]
31	RMPTC7104QCKB	AC		B	Block Resistor (100KΩ×7 1/4W ±10%)	[RA1]
32	RMPTE4471RCHZ	AD		B	Capacitor array (470pF×4)	[CA1]
33	RMPTC8104QCKB	AD		B	Block resistor (100KΩ×8 1/8W ±10%)	[RA2]

6 Display PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
34	RMPTC4104QCKB	AC		B	Block resistor (100KΩ×4 1/8W ±10%) [RA3]
35	LBNDJ2003SCZZ	AA		C	Band,wire (Large)
36	PSPAG6729BHZZ	AD	N	C	DISP. spacer
37	VVD16MD08GK−1	BE		B	Display tube
	(Unit)				
901	CPWBN7431BH02	CA	N	E	Display PWB unit

7 Power supply PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LBNDJ6638BHZZ	AA		C	Nylon band (100mm) [C2]
2	LX−BZ6782BHZZ	AA		C	Screw (3×8KS)
3	PRDAF6651RCZA	AG		C	Heat sink
4	QCNCM1101BHZZ	AC		C	Connector (5273−2)(2P) [PS CN]
5	QCNW−7575RCZZ	AE		C	PS cable (2pin)
6	QCNW−7640RCZZ	AC		C	GND wire 1 [GND]
⚠ 7	QFS−C2521TAZZ	AE		A	Fuse (250V 2.5A) [F1]
8	QFSHD2109AFZZ	AC		C	Fuse holder (HD2109AF) [F1]
9	RC−EZ688NRC1J	AQ		C	Capacitor (63WV 6800μF) [C1]
10	RCiLC6652RCZZ	AK		C	Coil (MC182−201M) [L1]
11	RVR−M5410QCN3	AD		B	Variable resistor (50K)(CT−6P) [VR1]
12	VCEAGU1VW228M	AG		C	Capacitor (35WV 2200μF) [C2]
13	VCQYNA2AM103K	AA		C	Capacitor (100WV 0.010μF) [C3]
14	VHDCP301///−1	AL	N	B	Diode (CP301) [DB1]
15	VHiSTR2124/−1	AR		B	IC (STR2124) [IC1]
16	VRD−RC2EY103G	AA		C	Resistor (1/4W 10KΩ ±2%) [R2]
17	XBPSD30P15KS0	AA		C	Screw (3×15KS)
18	XNESD30−24000	AA		C	Nut (N3 ZMC)
	(Unit)				
901	CPWBF7290BH05	BM		E	Power supply PWB unit

8 Noise filter PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNW−7356RCZZ	AF		C	PS cable
⚠ 2	QFS−C1322QCZZ	AE		A	Fuse (250V 1A) [F1]
3	QFSHD2109AFZZ	AC		C	Fuse holder (HD2109AF) [F1]
4	RC−FZ1041RC2E	AE		C	Capacitor (250WV 0.1μF) [C1]
5	RC−FZ2241RC2E	AE		C	Capacitor (250WV 0.22μF) [C2]
6	RCiLC6654RCZZ	AK		C	Coil (PLAC5020R6) [L1]
7	VRD−RB2HY394J	AA		C	Resistor (1/2W 390KΩ ±5%) [R1]
8	RTRNP9514BHZZ	BG		B	Power transformer
	(Unit)				
901	CPWBF7288BH11	BN	N	E	Noise filter PWB unit [KA,KB]
902	CPWBF7288BH12	BN	N	E	Noise filter PWB unit [TQ,TR,TS]

9 Pop−up PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LBNDJ2003SCZZ	AA		C	Band,wire (Large)
2	QCNCW6918BH09	AP		C	Connector (9pin) [DISP CN2]
3	QCNCW6918BH11	AR		C	Connector (11pin) [DISP CN1]
4	VVKFiP7B13/−1	AX		B	Display tube
	(Unit)				
901	CPWBF7136BH01	BL		E	Pop up PWB unit

10 Articles for consumption

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	DPAPR1006CSZZ	AR		S	Roll paper (5rolls/pack)
2	PRBN−6640RCZZ	AX		S	Ribbon cassette
3	UiNK−1001CCZZ	AK		S	Ink for stamp (5cc)
4	PSHEK6823BHZZ	AK		S	Key sheet (Programing)

10 Articles for consumption

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
4	PSHEK6822BHZZ	AR		S	Key sheet (Standard)
	PSHEK6777RCZZ	AC		S	Key sheet (Blank)

11 Special service tools and service options

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	CKÖG-6708RCZZ	BU		S	Expansion PWB (for ER-A5IN/A5RS)
2	UKÖG-6704RCZZ	AV		S	Loop back connector for SIO
3	LKGiM7113RCZZ	AK		B	Service key
4	GCÖVB7047RCZZ	AY		S	Key switch cover A
5	LKGiM7126RCZZ	AL		B	Mode key grip cover
6	DKiT-8633RCZZ	BE		S	Drawer fixing kit (Include №21~26)
7	DKiT-8643RCZZ	BG		S	Near end sensor unit (Include №31~36)
21	LBRC-2321RCZZ	AN		S	Fixing bracket
22	XTPSD40P16000	AA		C	Screw (4×16)
23	XBSSD40P16000	AA		C	Screw (4×16)
24	XUSSD40P20000	AA		C	Screw (4×20)
25	XBPSD40P22000	AA		C	Screw (4×22)
26	XNESD40-32000	AA		C	Nut
31	DUNTK8296RCZZ	BC		S	Near end sensor
32	QCNW-7049RCZZ	AD		C	Ground wire
33	LX-BZ6773RCZZ	AA		C	Screw
34	XBPSD30P04KS0	AA		C	Screw (3×4KS)
35	XBPSD40P06KS0	AA		C	Screw (4×6KS)
36	XWHSD30-05080	AA		C	Washer

12 AC CORD

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
⚠ 1	QACCJ1413QCZZ	AG		B	AC cord Japan, RB6, RB7, RC5, SC, SD
⚠	QACCA3441QCZZ	AL		B	AC cord SB
⚠ 2	QACCD8411QCZZ	AN		B	AC cord U. S. A, Canada, Japan (Okinawa), Guam
	QTANP0004HCZZ	AB		B	Lug terminal U. S. A, Canada
⚠ 3	QACCE3120QCN5	AP		B	AC cord RA1, RA2, RB3, RB5, SG, TQ, TR, TS, K AC cord Yugoslavia
⚠ 4	QPLGA4501CCZZ	AK		B	Plug SE
⚠	QCNW-6629RCZZ	AN		B	AC cord SE
⚠ 5	QPLGA0018WRE0	AN		B	Plug SH, RA5
⚠	QCNW-6629RCZZ	AN		B	AC cord SH, RA5, SHE
⚠	PHOG-1023CCZZ	AB		B	Bushing for AC cord SH, RA5, SHE
⚠ 6	QACCL1018CCZZ	AS		B	AC cord KA, SL
7	QTANP0004HCZZ	AB		B	Lug terminal RC2, SM, SMT, RC1, SBA, RB8
	QPLGA0006QCZZ	AN		B	Plug KB, SM, SMT, RC1, SBA, RB8, RC2
	QCNW-1035CCZZ	AH		B	AC cord KB, RC1, RC2, SM, SMT, SBA
⚠	QCNW-6629RCZZ	AN		B	AC cord RB8
⚠ 8	QCNW-6629RCZZ	AN		B	AC cord RB4 (AC cord only. The plug is not included.)
⚠ 9	QACCZ3423QCZZ	AH		B	AC cord SJ, SJ2

Note : Instead of AC cords QACCZ3421QCZZ/QACCK1008CCZZ, the AC cord QACCE1422QCZZ(No.3) is supllied as service spare part.

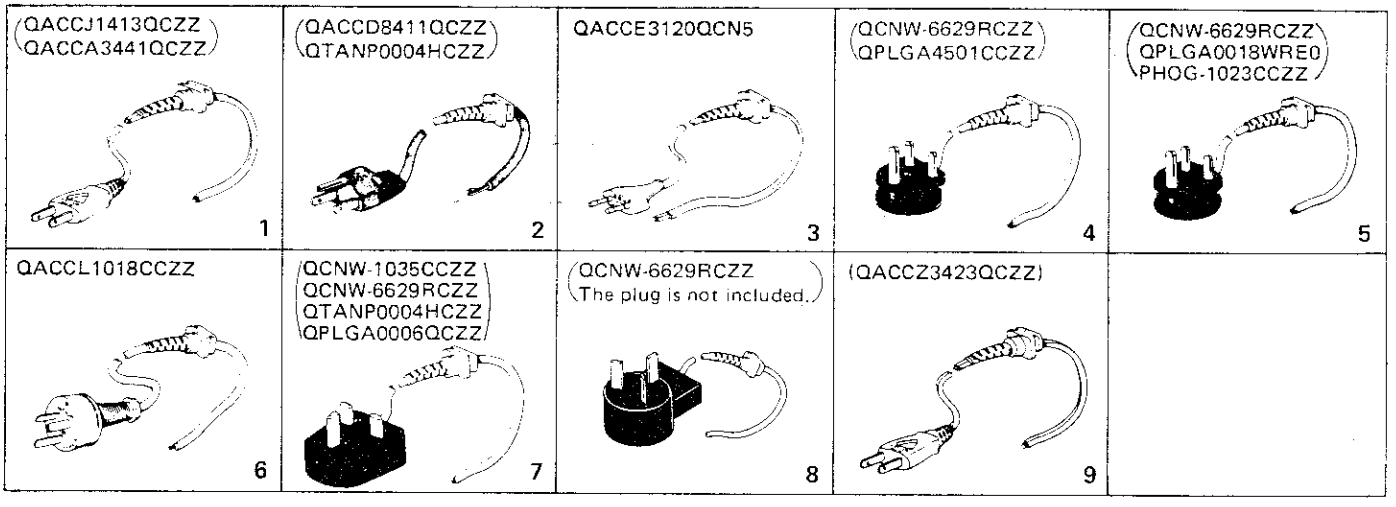


Table of destinations

SELECTION CODE	COUNTRIES
U	U. S. A., Guam
A	Canada
TS	Germany
TQ	SEEG territory other than Germany (Stamp : English)
TR	SEEG territory other than Germany (Stamp : Spanish)
KB	U. Kingdom
KA	Australia

SELECTION CODE	COUNTRIES
K	Korea

SELECTION CODE	COUNTRIES
SB	Saudi Arabia (127V area)
SBA	Saudi Arabia (220V area)
SC	Taiwan
SD	Venezuela
SE	Hong Kong
SG	Lebanon, Syria, Greece, Pakistan, Iran, Egypt, Thailand, Iraq, Mauritius, Seychelles, Tahiti, Jordan, Sudan, Turkey
SH	South Africa (U. S. A. version)
SHE	South Africa (Europe version)
SJ	Philippines (Europe version)
SJ2	Philippines (U. S. A. version)
SM	Kuwait, Qatar, Oman, UAE, Malta, Bahrain
SMT	Nigeria, Yemen, Kenya

SELECTION CODE	COUNTRIES
RA1	Morocco, Algeria, Tunisia, West Africa
RA2	Chile, Uruguay, Peru, Argentina, Paraguay
RA5	Sri Lanka

SELECTION CODE	COUNTRIES
RB3	Indonesia
RB4	
RB5	Cyprus
RB6	Panama
RB7	Barbados
RB8	Malaysia (U. S. A. version)

SELECTION CODE	COUNTRIES
RC1	Malaysia (Europe version)
RC2	Singapore
RC5	Dominican Republic, Ecuador

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PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
[C]				
CCABM7171BHZZ	3- 2	BQ		D
CCAS-6679BH01	3- 31	BE		D
CCAS-6680BH01	3- 501	BG		E
CFRM-6683BH01	3- 16	AW		C
CKOG-6708RCZZ	11- 1	BU		S
CPLTM6680BHZB	3- 37	BM		D
CPLU-6641BH01	3- 15	BC		B
CPWBF7136BH01	1- 5	BL		E
//	9- 901	BL		E
CPWBF7288BH11	2- 2	BN	N	E
//	8- 901	BN	N	E
CPWBF7288BH12	2- 2	BN	N	E
//	8-902	BN	N	E
CPWBF7290BH05	2- 24	BM		E
//	7- 901	BM		E
CPWBF7385BH01	1- 53	BT		E
CPWBN7431BH02	1- 15	CA	N	E
//	6- 901	CA	N	E
CPWBN7433BH01	2- 23	CK	N	E
//	5- 901	CK	N	E
[D]				
DKiT-8633RCZZ	11- 6	BE		S
DKiT-8643RCZZ	11- 7	BG		S
DPAPR1006CSZZ	10- 1	AR		S
DUNT-1307BHZZ	3- 504	AY		E
DUNT-1817BH01	2- 101	AW		E
DUNTK8296RCZZ	11- 31	BC		S
DUNTK9161BHZZ	1- 501	BS		E
[G]				
GBOXD7122BHZZ	3- 901	BY		E
GCAB-7143RCZZ	1- 4	AH		D
GCABA7142RCAB	2- 30	BD		D
GCABB7141RCSA	1- 9	AY		D
GCAS-6680BHZZ	3- 12	BB		D
GCOVA7038RCZA	1- 1	AQ		D
GCOVA7039RCSA	1- 3	AM		D
GCOVA7040RCSA	2- 31	AQ		D
GCOVA7053BHZZ	3- 32	AR		D
GCOVB7041RCZZ	1- 46	AY		D
GCOVB7042RCZZ	1- 50	AW		D
GCOVB7047RCZZ	11- 4	AY		S
GDRW-6679BH01	3- 503	BG		D
GFTAF6770RCSA	2- 40	AC		D
GFTAS6769RCSA	2- 29	AC		D
[H]				
HPNLC6818BHSM	1- 11	AP	N	D
[J]				
JKNBZ6882BHZZ	1- 40	AE		C
[K]				
Ki-OB6754RCZZ	2- 3	CB		E
[L]				
LANGQ7472RCZA	2- 22	AE		C
LANGQ7476RCZA	2- 11	AF		C
LANGT7465RCZZ	1- 23	AK		C
LANGT7505RCZZ	1- 16	AM		C
LBNDJ0005FCZZ	1- 34	AB		C
LBNDJ2003SCZZ	1- 12	AA		C
//	2- 50	AA		C
//	6- 35	AA		C
//	9- 1	AA		C
LBNDJ2004BHZZ	1- 41	AB		C
LBNDJ6638BHZZ	7- 1	AA		C
LBRC-2321RCZZ	11- 21	AN		S
LBRC-6663BHZZ	3- 6	AQ		C
LCHSM6692RCZA	2- 39	AW		C
LFRM-6682BHZZ	3- 22	AN		C
LFRM-6689BHZZ	1- 51	AX		C
LHLOK6813RCSA	2- 15	AE		C
LHLDW0007SCZZ	2- 18	AA		C
LHLDW0008SCZZ	2- 26	AA		C
LHLDW0024SCZZ	1- 31	AA		C
//	2- 28	AA		C
LHLDW4081CCZZ	3- 56	AC		C
LHLDW6820BHZZ	1- 55	AE		C
LHLDW6821BHZZ	2- 52	AD		C
LKGiM7110RCZZ	1- 24	AG		B
//	4- 5	AG		B
LKGiM7111RCZZ	1- 24	AG		B
//	4- 5	AG		B

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
LKGiM7113RCZZ	11- 3	AK		B
LKGiM7126RCZZ	11- 5	AL		B
LKGiM7129RCZZ	1- 24	AE		B
//	4- 5	AE		B
LKGiM7331BHZZ	3- 35	AE		B
//	4- 6	AE		B
LKGiM7356BHZZ	2- 37	AK		B
//	4- 7	AK		B
LKGiW7256RCZZ	1- 25	AP		B
LKGiW7330BHZZ	3- 33	AY		B
LKGiW7355BHZA	2- 34	AV		B
LPiNS6641BHZZ	3- 44	AD		C
LX-BZ6773RCZZ	11- 33	AA		C
LX-BZ6775BHZZ	3- 17	AA		C
LX-BZ6776BHZZ	3- 13	AA		C
LX-BZ6782BHZZ	1- 17	AA		C
//	7- 2	AA		C
LX-LZ5001CHZZ	2- 48	AC		C
[M]				
MCAMM6634BHZZ	3- 21	AE		C
MLEVF6695BHZZ	3- 8	AK		C
MLEVF6697BHZZ	3- 46	AN		C
MLEVF6698BHZZ	3- 42	AH		C
MSPRB6722BHZZ	3- 40	AC		C
MSPRB6724BHZZ	3- 43	AC		C
MSPRC6715BHZZ	3- 51	AE		C
MSPRC6723BHZZ	3- 27	AE		C
MSPRK6718BHZZ	3- 36	AF		C
MSPRK6730BHZZ	2- 36	AC		C
MSPRT6713BHZZ	3- 18	AD		C
MSPRT6714BHZZ	3- 7	AE		C
MSPRT6725BHZZ	3- 47	AC		C
[N]				
NROLP6650BHZZ	3- 4	AP		C
//	3- 28	AP		C
NSFTM6650BHZZ	3- 50	AD		C
[P]				
PCUSG1220BHZZ	2- 9	AE		C
PFiLW6923BHSH	1- 6	AR	N	D
PFiLW6924BHSH	1- 10	AQ	N	D
PFiLW6925RCZZ	1- 2	AK		D
PFiLW6926RCZZ	1- 14	AD		D
PGUMM6695BHZZ	3- 3	AE		D
PGUMM6696BHZZ	3- 25	AE		D
PGUMM6699RCZZ	2- 5	AB		C
PGUMM6710BHZZ	1- 52	AR		C
PHOG-1060CCZZ	1- 38	AA		C
PRBN-6640RCZZ	10- 2	AX		S
PRDAF6650RCZB	5- 74	AG		C
PRDAF6651RCZA	7- 3	AG		C
PRNGT6637BHZZ	3- 34	AA		C
PRNGT6639BHZZ	2- 59	AB		C
PSHEK6777RCZZ	1- 49	AC		D
//	10- 4	AC		S
PSHEK6822BHZZ	1- 47	AR	N	D
//	10- 4	AR		S
PSHEK6823BHZZ	1- 48	AK	N	D
//	10- 4	AK		S
PSHEP6789BHZZ	2- 13	AP		C
PSHEP6812BHZZ	4- 3	AF		D
PSKR-6628BHZZ	3- 11	AG		C
PSKR-6629BHZZ	3- 9	AL		C
PSPAG6729BHZZ	1- 7	AD	N	C
//	6- 36	AD	N	C
PSTM-6780RC01	2- 4	AR		C
PSTM-6782RCZZ	2- 4	AS		C
PSTM-6785RC01	2- 4	AS		C
[Q]				
QACCE3120QCN5	2- 16	AL		B
QACCL7421QCN1	2- 16	AW		B
QCNCM1060AC03	5- 86	AB		C
QCNCM1101BHZZ	5- 75	AC		C
//	7- 4	AC		C
QCNCM2379RC0E	5- 76	AC		C
QCNCM5278NCZZ	5- 77	AC		B
QCNCM6865RC0I	6- 23	AC		C
QCNCM6865RC1A	6- 24	AD		C
QCNCM6865RC2J	5- 78	AD		C
QCNCM6926RC1H	5- 79	AE		C
QCNCM7073RC6H	5- 80	AM		C

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
QCNCW1057ACZZ	5- 81	AB		C	
QCNCW1084ACZZ	5- 82	AG		C	
QCNCW6918BH09	9- 2	AP		C	
QCNCW6918BH11	9- 3	AR		C	
QCNCW7086RC5J	5- 85	AK		C	
QCNW-7049RCZZ	11- 32	AD		C	
QCNW-7120RCZZ	1- 39	AE		C	
//	2- 56	AE		C	
QCNW-7122RCZZ	2- 10	AD		C	
QCNW-7124RCZZ	5- 83	AB		C	
QCNW-7125RCZZ	2- 8	AD		C	
QCNW-7212RCZZ	2- 16	AH		B	
QCNW-7356RCZZ	8- 1	AF		C	
QCNW-7434RCZZ	1- 29	AC		C	
QCNW-7518RCZZ	2- 43	AR		C	
//	5- 84	AR		C	
QCNW-7575RCZZ	2- 42	AE		C	
//	7- 5	AE		C	
QCNW-7590RCZZ	2- 41	AC		C	
QCNW-7591RCZZ	2- 54	AE		C	
QCNW-7592RCZZ	2- 41	AD		C	
QCNW-7599RCZA	6- 25	AQ	N	C	
QCNW-7615RCZZ	6- 26	AT		C	
QCNW-7616RCZZ	6- 27	AK		C	
QCNW-7640RCZZ	7- 6	AC		C	
QCNW-7722BHZZ	1- 43	BA	N	C	
QFS-A1037CCZZ	5- 87	AC		A	
QFS-C1322QCZZ	8- 2	AE		A	
QFS-C2521TAZZ	7- 7	AE		A	
QFS-C4081CCZZ	5- 88	AF		A	
QFSHD2109AFZZ	5- 49	AC		C	
//	7- 8	AC		C	
//	8- 3	AC		C	
QNCW-7615RCZZ	1- 36	AT		C	
QPLGA0006QCZZ	2- 16	AQ		C	
QSOCZ2042SC32	5- 89	AE		C	
QSW-C9212QCZZ	2- 17	AH		B	
QSW-M6872BHZZ	3- 14	AR		B	
QSW-S6850BHZZ	1- 28	AM	N	B	
QTANN6629RCZZ	2- 14	AF		C	
QTANP0004BHZA	2- 20	AE	N	C	
[R]					
RALMB6640RCZZ	5- 90	AF		B	
RALML6647BHZZ	3- 49	AR		B	
RC-EZ105ARC1A	5- 68	AD		C	
//	6- 16	AD		C	
RC-EZ107BRC1A	5- 69	AH		C	
RC-EZ476ARC1A	5- 70	AF		C	
RC-EZ685ARC1C	5- 71	AD		C	
RC-EZ688NRC1J	7- 9	AQ		C	
RC-FZ1041RC2E	8- 4	AE		C	
RC-FZ2241RC2E	8- 5	AE		C	
RC-KZ1054CCZZ	5- 50	AB		C	
//	6- 15	AB		C	
RC-Z1N104RCZU	6- 21	AD		C	
RCiLC6647BHZZ	5- 91	AK	N	C	
RCiLC6652RCZZ	7- 10	AK		C	
RCiLC6654RCZZ	8- 6	AK		C	
RCORF1016LCZZ	1- 20	AL		C	
RCORF6650RCZZ	2- 47	AE		C	
RCORF6654RCZZ	1- 32	AH		C	
RCORF6661RCZZ	2- 45	AK		C	
//	5- 47	AK		C	
RCORF6662RCZZ	1- 45	AK		C	
//	2- 21	AK		C	
RCORF6666RCZZ	2- 25	AM		C	
//	5- 48	AM		C	
RCORF6674RCZZ	5- 92	AB		C	
RCORF6683RCZZ	1- 18	AM		C	
RCORF7001SCZZ	2- 49	AL		C	
RCRSP6658RCZZ	6- 29	AE		B	
RCRSP6661RCZZ	5- 93	AD		B	
RCRSZ6644RCZZ	6- 30	AD		B	
RFiLN6012RCZZ	6- 28	AB		C	
RFiLN6014RCZZ	5- 72	AC		C	
RMPTC4103QCKB	5- 94	AC		B	
RMPTC4104QCKB	6- 34	AC		B	
RMPTC5103QCKB	5- 95	AC		B	
RMPTC6103QCKB	5- 96	AC		B	
RMPTC7104QCKB	6- 31	AC		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
RMPTC8102QCKB	5- 97	AD		B	
RMPTC8103QCKB	5- 98	AD		B	
RMPTC8104QCKB	6- 33	AD		B	
RMPTE4471RCHZ	6- 32	AD		B	
RTRNH6783RCZZ	5- 99	AN		B	
RTRNP9514BHZZ	8- 8	BG		B	
RVR-M2517QCZZ	5- 100	AE		B	
RVR-M5410QCN3	7- 11	AD		B	
[S]					
SPAKA7985RCZZ	4- 2	AQ		D	
SPAKA7986RCZZ	4- 4	AR		D	
SPAKC7996BHSF	4- 1	AZ	N	D	
SSAKA5004BHZZ	3- 10	AA		D	
SSAKH3012CCZZ	4- 8	AA		D	
SSAKH3015CCZZ	4- 13	AA		D	
SSAKH4231CCZZ	4- 15	AA		D	
[T]					
TCADH6788BHZZ	4- 16	AC		D	
TCADZ2001BHZA	4- 11	AM		D	
TCAUS0002BHZZ	4- 17	AD		D	
TCAUS6677BHZZ	1- 37	AD		D	
TGANE1001BHZA	4- 11	AF		D	
TiNSE7313BHZZ	4- 10	AX	N	D	
TiNSF7314BHZZ	4- 10	AX	N	D	
TiNSG7315BHZZ	4- 10	AX	N	D	
TiNSS7316BHZZ	4- 10	AX	N	D	
[U]					
UBATN6639BHZZ	5- 46	BC		B	
UBNDA1008CCZZ	4- 101	AA		C	
UiNK-1001CCZZ	4- 9	AK		S	
//	10- 3	AK		S	
UKOG-6704RCZZ	11- 2	AV		S	
[V]					
VCCCPU1HH150J	6- 17	AA		C	
VCCSPU1HL470J	5- 61	AA		C	
VCEAEU1CW106M	6- 18	AA		C	
VCEAGU1CW106M	5- 51	AA		C	
VCEAGU1CW108M	5- 101	AD		C	
VCEAGU1HW105M	5- 52	AA		C	
VCEAGU1HW227M	5- 102	AC		C	
VCEAGU1HW477M	5- 103	AD		C	
VCEAGU1VW228M	7- 12	AG		C	
VCEAGU2AW106M	5- 53	AB		C	
VCEAGU2AW226M	5- 54	AB		C	
VCKYPU1HB101K	5- 55	AA		C	
VCKYPU1HB102K	5- 56	AA		C	
//	6- 19	AA		C	
VCKYPU1HB152K	5- 57	AA		C	
VCKYPU1HB221K	5- 58	AB		C	
VCKYPU1HB331K	5- 59	AA		C	
//	5- 59	AA		C	
VCKYPU1HB471K	5- 60	AA		C	
//	6- 20	AA		C	
VCQYNA2AM103K	7- 13	AA		C	
VCQYNU1HM103K	5- 62	AA		C	
VCQYNU1HM683K	5- 63	AB		C	
VCTYPU1EX223M	6- 22	AB		C	
VHDCP301///-1	7- 14	AL	N	B	
VHDDSS131HV-1	5- 7	AA		B	
VHDDSS133HV-1	5- 9	AA		B	
//	6- 12	AA		B	
VHDEK04////-1	5- 8	AD		B	
//	6- 13	AD		B	
VHDPS102R//-1	5- 10	AD	N	B	
VHEE102////-1	5- 43	AC		B	
VHEMTZ9.1C/-1	5- 11	AA		B	
VHERD39EB7/-1	6- 14	AB		B	
VHERD4.3EL1-1	5- 44	AA		B	
VHERD5.6FB3-1	5- 45	AC		B	
VHiF258016PC/	5- 1	AZ		B	
VHiGD4069D/-1	6- 3	AG		B	
VHiGD74HC86DS	5- 6	AH	N	B	
VHiGD74LS393D	6- 4	AL	N	B	
VHiHM128F12SL	5- 3	BN		B	
VHiH4728A75FS	6- 1	AX		B	
VHiH641510810	5- 2	BA		B	
VHiiR3M03AV-1	5- 105	AH		B	
VHiiR9393N/-1	5- 5	AD		B	
VHiKiD65503-1	5- 106	AK		B	
VHiM54567P/-1	5- 107	AK		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VHiM66004FP-1	6- 2	AY		B	
VHiSN74HC00NS	5- 4	AC		B	
VHiSTA401A/-1	5- 108	AP		B	
VHiSTR2124/-1	7- 15	AR		B	
VHi27040RAJ1A	5- 104	BR	N	B	
VRD-HT2EY8R2J	6- 5	AA		C	
VRD-RB2HY394J	8- 7	AA		C	
VRD-RB2HY561J	5- 12	AA		C	
VRD-RC2EY100J	5- 13	AA		C	
VRD-RC2EY101J	5- 14	AA		C	
VRD-RC2EY102J	5- 15	AA		C	
//	5- 15	AA		C	
VRD-RC2EY103G	7- 16	AA		C	
VRD-RC2EY103J	5- 16	AA		C	
//	5- 16	AA		C	
VRD-RC2EY104J	5- 17	AA		C	
VRD-RC2EY105J	6- 6	AA		C	
VRD-RC2EY132G	5- 18	AA		C	
VRD-RC2EY182G	5- 19	AA		C	
VRD-RC2EY202J	5- 20	AA		C	
VRD-RC2EY203G	5- 21	AA		C	
VRD-RC2EY220J	5- 22	AA		C	
VRD-RC2EY221J	6- 8	AA		C	
VRD-RC2EY272J	5- 23	AA		C	
//	6- 7	AA		C	
VRD-RC2EY273J	5- 24	AA		C	
VRD-RC2EY330J	5- 25	AA		C	
//	6- 9	AA		C	
VRD-RC2EY332J	5- 26	AA		C	
VRD-RC2EY333J	5- 27	AA		C	
VRD-RC2EY391J	5- 28	AA		C	
VRD-RC2EY392J	5- 29	AA		C	
VRD-RC2EY472G	5- 30	AA		C	
VRD-RC2EY472J	5- 31	AA		C	
//	6- 10	AA		C	
VRD-RC2EY473J	5- 32	AA		C	
//	6- 11	AA		C	
VRD-RC2EY562J	5- 33	AA		C	
VRD-RC2EY563J	5- 34	AA		C	
VRD-RC2EY622J	5- 35	AA		C	
VRD-RC2EY623J	5- 36	AA		C	
VRD-RC2EY682J	5- 37	AA		C	
VRD-RC2EY912G	5- 38	AA		C	
VRNRC2EK1002F	5- 39	AA		C	
VRNRC2EK1201F	5- 40	AA		C	
VRNRC2EK1303F	5- 41	AA		C	
VRNRC2EK3601F	5- 42	AA		C	
VRS-RE3AAR68J	5- 111	AA		C	
VSKTD1414//-1	5- 110	AL	N	B	
VS2SA1266-/-1	5- 64	AC		B	
VS2SA673-//-1	5- 65	AD		B	
VS2SB881-//-1	5- 109	AH		B	
VS2SC3198-/-1	5- 67	AL		B	
VS2SC4153-/-1	5- 112	AG		B	
VS2SD667-//-1	5- 66	AD		B	
VVD16MD08GK-1	6- 37	BE		B	
VVKFiP7B13/-1	9- 4	AX		B	
[X]					
XBBSC30P06000	1- 8	AA		C	
XBBSC30P20000	2- 32	AA		C	
XBPBZ40P08K00	2- 19	AA		C	
XBPSD26P04K00	1- 26	AA		C	
XBPSD30P04KS0	11- 34	AA		C	
XBPSD30P06KS0	2- 44	AA		C	
XBPSD30P15KS0	7- 17	AA		C	
XBPSD40P06KS0	11- 35	AA		C	
XBPSD40P06K00	3- 48	AA		C	
XBPSD40P06000	3- 52	AA		C	
XBPSD40P22000	11- 25	AA		C	
XBSSD30P08000	5- 113	AA		C	
XBSSD40P16000	11- 23	AA		C	
XEBSD30P06000	1- 21	AA		C	
//	2- 35	AA		C	
XEBSD30P08000	1- 35	AA		C	
//	2- 12	AA		C	
XHBSD30P06000	1- 13	AA		C	
//	5- 73	AA		C	
XHBSD30P08000	1- 19	AA		C	
XHBSD30P12000	3- 26	AA		C	
XHBSD40P15000	3- 39	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
XHPSC30P08000	3- 41	AA		C	
XHPSD30P06K00	1- 33	AA		C	
//	2- 7	AA		C	
XHPSD40P08KS0	2- 38	AA		C	
XJBSD30P10000	2- 46	AA		C	
XJPSD30P12X00	2- 6	AB		C	
XNESD30-24000	2- 27	AA		C	
//	5- 114	AA		C	
//	7- 18	AA		C	
XNESD40-32000	3- 24	AA		C	
//	11- 26	AA		C	
XNESD60-50000	3- 29	AA		C	
XRESJ40-06000	3- 45	AA		C	
XRESJ50-06000	3- 20	AA		C	
XTPSD40P16000	11- 22	AA		C	
XUBSD40P08000	2- 1	AA		C	
XUPSD23P08000	1- 27	AA		C	
XUPSD30P08000	3- 5	AA		C	
XUPSD30P16000	2- 51	AA		C	
XUSSD40P20000	11- 24	AA		C	
XWHSD30-05080	11- 36	AA		C	
XWSSD40-10000	3- 23	AA		C	
XWSSD50-13000	2- 55	AA		C	
XWSSD60-15000	3- 30	AA		C	
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0ALZD2006-670	1- 54	AA		C	

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